

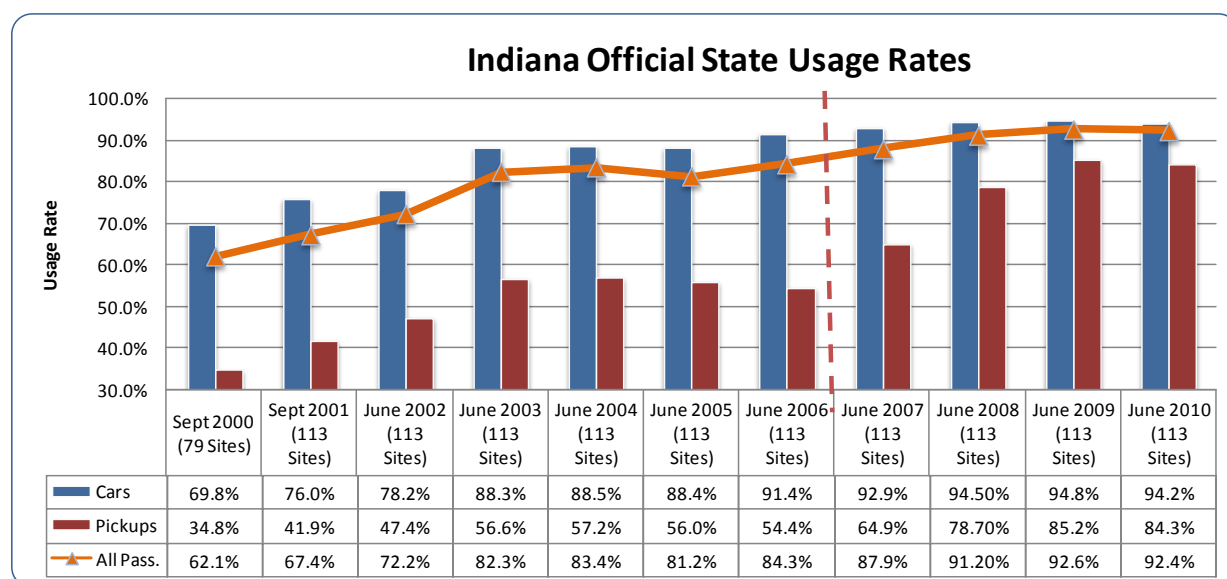
# Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use

*Indiana's 2010 "all passenger vehicles" safety belt usage rate stayed close to its record high. The state usage rate for front-seat outboard occupants of all passenger vehicles was 92.4 percent in June 2010, while the all-time high was 92.6 percent in June 2009.*

This report was prepared by the Center for Road Safety, Purdue University, based on data obtained from Indiana Criminal Justice Institute.

## Indiana Rates

In 2010, the “all passenger vehicles” safety belt usage rate stayed close to the all-time high in Indiana. The weighted usage rate for front-seat outboard occupants of all passenger vehicles was 92.4 percent in June 2010, virtually the same as the 92.6 percent for June 2009. Figure 1 shows the succession of the official usage rates for occupants of cars, pickup trucks, and all passenger vehicles. It also illustrates the 20 percent surge in the usage rate of pickup truck occupants since 2007, due to the passage of the new Indiana restraint usage legislation. The new law closed the old loophole that excluded pickup trucks occupants from the mandatory safety belt usage.



**Figure 1 – Indiana official safety belt usage rate increase**

The usage rate for occupants of passenger cars (94.2 percent) is not much different from the previous high rate of 94.8 percent in 2009. The usage rates for occupants of mini-vans and SUVs are historically close to those of passenger cars. In 2010, the “non-weighted” rate for mini-vans was 95.2 percent and was 94.4 percent for SUVs. Despite the large gains, the pickup truck usage rate is still 10 percent lower than that of passenger cars. As the car usage rate borders 95 percent, the pickup truck usage rate continues to have the highest potential for increase. Pickup trucks typically represent approximately 17 percent of the vehicles observed in the surveys.

A breakdown of the usage rates by region indicates that the southern region of the state has suffered a decline in its usage rates (Figure 2.) The southern region, which had not shown the same gains as the other two regions until 2007, caught up with the rest of the state in the surveys of 2008 and 2009. However, the December 2009 mini-survey showed a large reversion to the 82.8 percent usage level (Appendix B). The June 2010 survey indicated an increase to 88.7 percent, but it is still at a substantially

lower rate than last year's record level. The central region usage rate stayed at 92.6 percent, virtually the same as the northern region, at 92.7 percent.

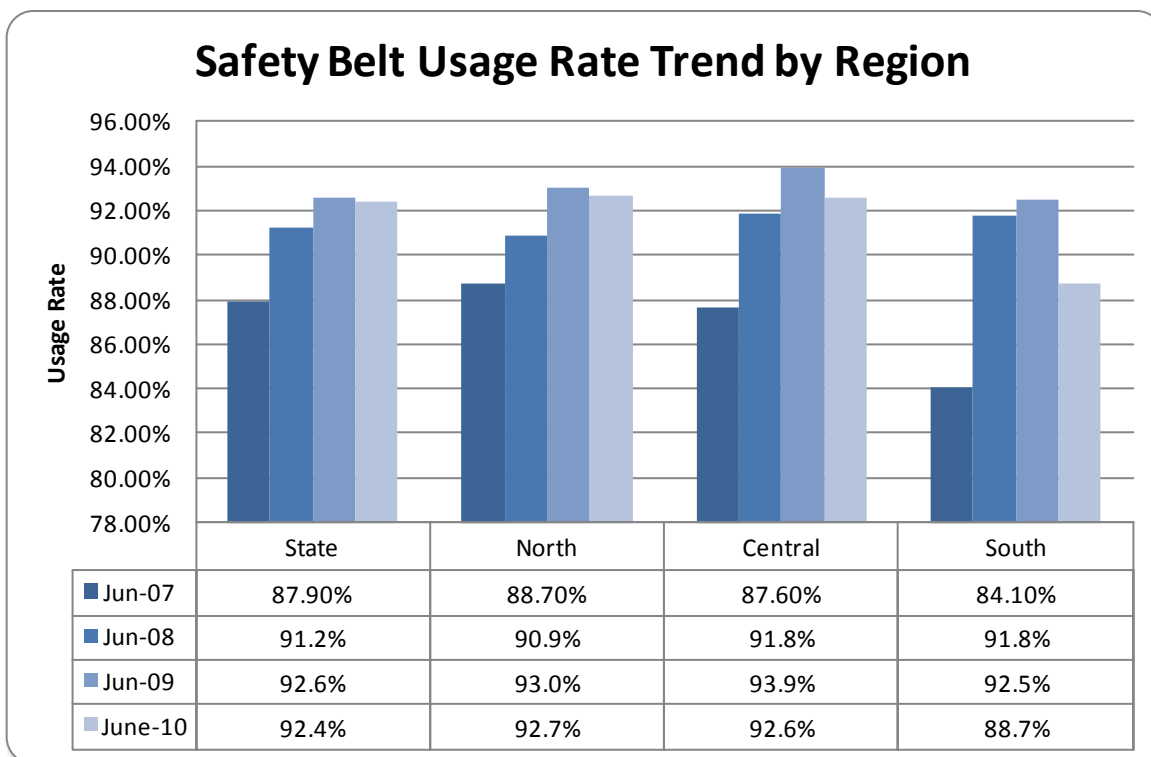


Figure 2 - Usage Rates by Region and by Year

Table 1 Effect of Unknowns in the Estimated Usage Rates

Region	Excluding Unknowns	Assuming Unknowns as Not belted	Vehicle Type	Excluding Unknowns	Assuming Unknowns as Not belted
State	92.4%	91.4%	Cars	94.2%	93.2%
North	92.7%	90.0%	Pickups	84.3%	83.2%
Central	92.6%	92.5%	All Passenger	92.4%	91.4%
South	88.7%	87.3%			

Seatbelt usage observers record one out of three outcomes: (1) Belted, (2) Not belted, or (3) Unknown<sup>1</sup>. The results in Table 1 illustrate the effect of excluding unknowns when calculating the usage rate. The numbers in the last columns were calculated assuming that all unknowns are in fact "not belted." These numbers are lower by up to 2.7 percent, and they represent the lower bound for the actual usage rates.

<sup>1</sup> Unknowns should only be marked when, after significant effort, the observer cannot see a safety belt but is not completely sure if the belt was not being used. Past research has shown that in a large number of these cases, the occupant is indeed unbelted.

## Usage by Road Classification

Seatbelt usage rates across the state vary, depending on the road classification. Historically, the highest rates occurred on freeways, followed by arterials, and then collectors (Figures 3 and 4.) Local roads usually exhibit the lowest usage rates, perhaps because of the long standing perception that safety belts were not needed for short trips and at lower speeds. As the usage rates increase across all road classes, some of these differences are diminishing. In 2010, urban local roads exhibited a seatbelt usage rate only 3.5 percent lower than urban freeways for cars and 7.8 percent lower for pickup trucks. In the 2010 survey, rural local roads and rural freeways presented smaller differences overall than in 2009, with rural local road usages lower by 3.7 percent for cars, but 9.8 percent for pickup trucks. When compared with 2009 values (Figure 4), urban local roads had the largest increase in usage rates (1.6 percent), followed by rural arterials (0.6 percent.) Urban collector roads lost 2.0 percent, or most of the 2.2 percent gain they had seen in 2009. Both rural and urban freeways exhibited decreases over one percent while other road classes saw smaller changes.

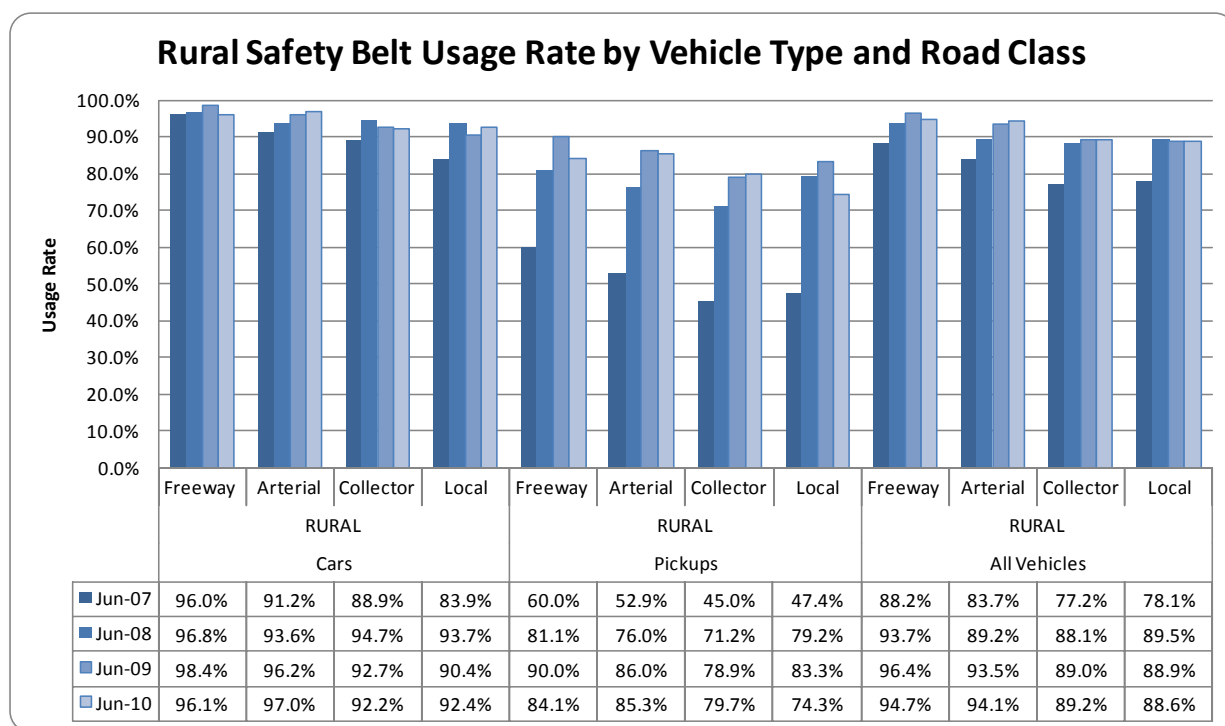


Figure 3 –Rural Safety Belt Usage by Vehicle Type and Road Class

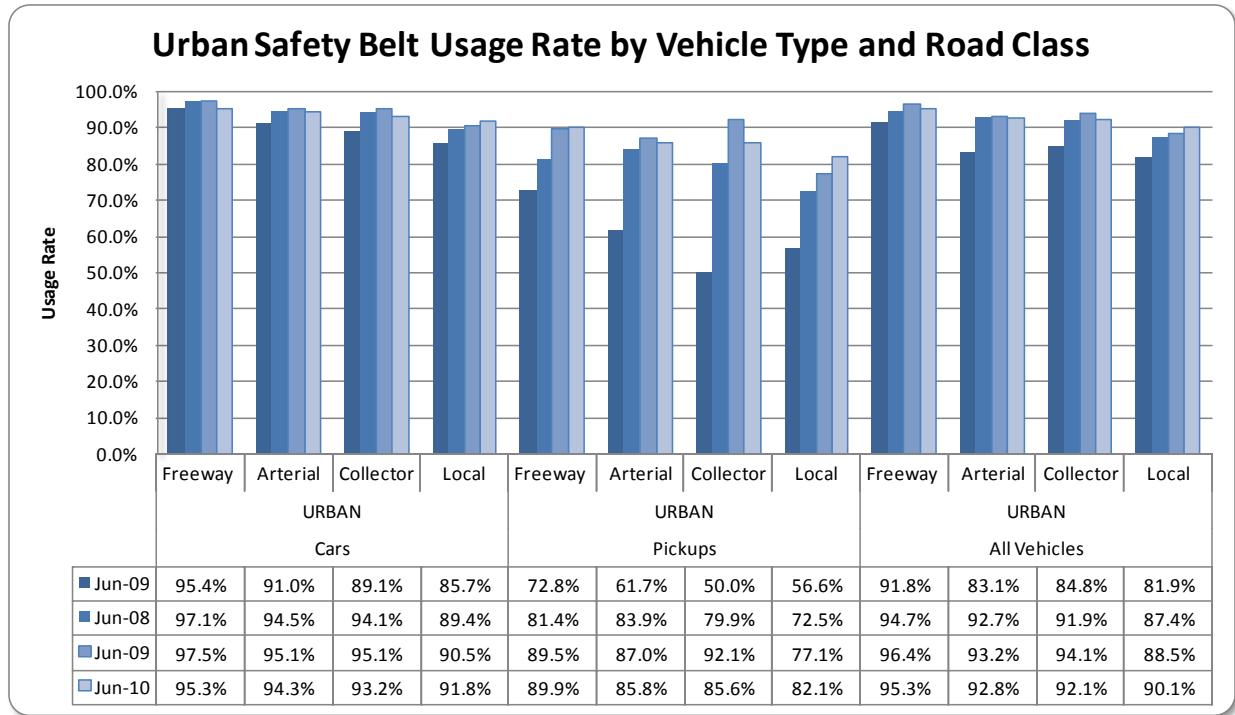


Figure 4 –Urban Safety Belt Usage by Vehicle Type and Road Class

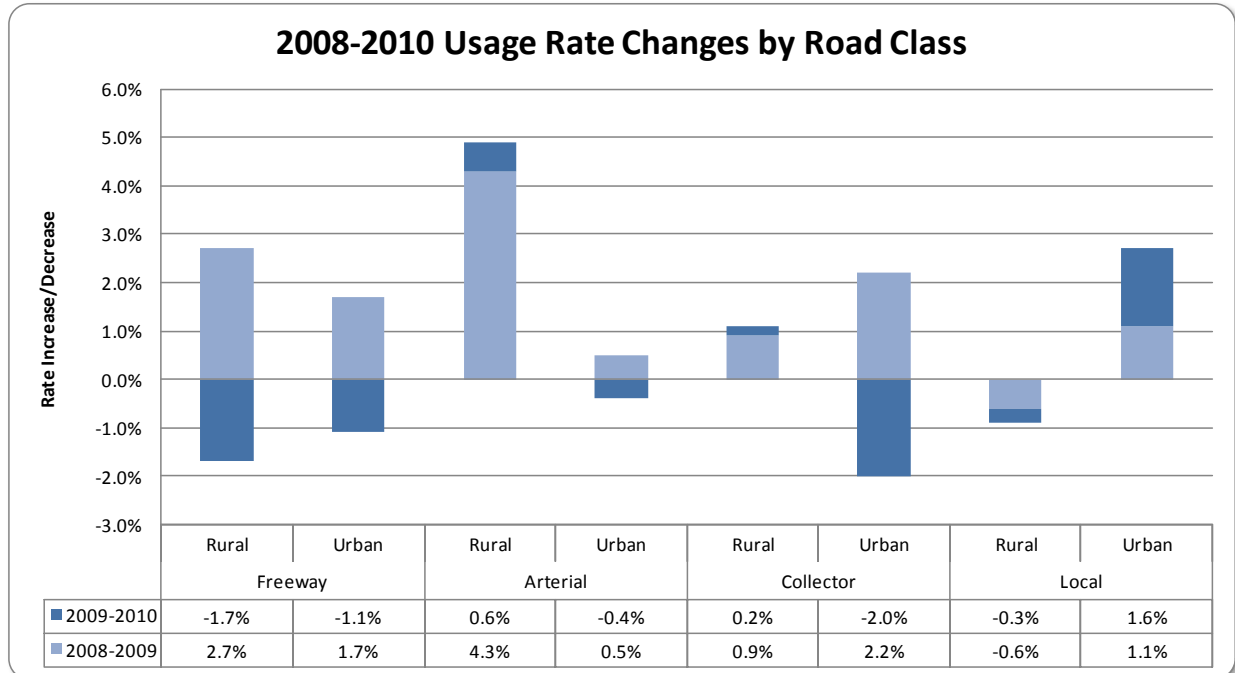


Figure 5 – Change Usage Rate by Road Class

Figure 5 displays the eight-year trend for each type of road. After some stagnation during 2003-2005, urban freeways began to show a consistent increase in the rates up to 2009. After reaching parity in usage rates in 2009, both urban and rural freeways exhibited a slight decrease in 2010. While urban collectors lost most of the growth in usage seen in 2009, rural arterials continued to experience a slight increase in usage, reaching their highest rates ever, at 94.1 percent. At the same time, urban local roads also continued their steady increase in usage, with a continued rise of 1.6 percent.

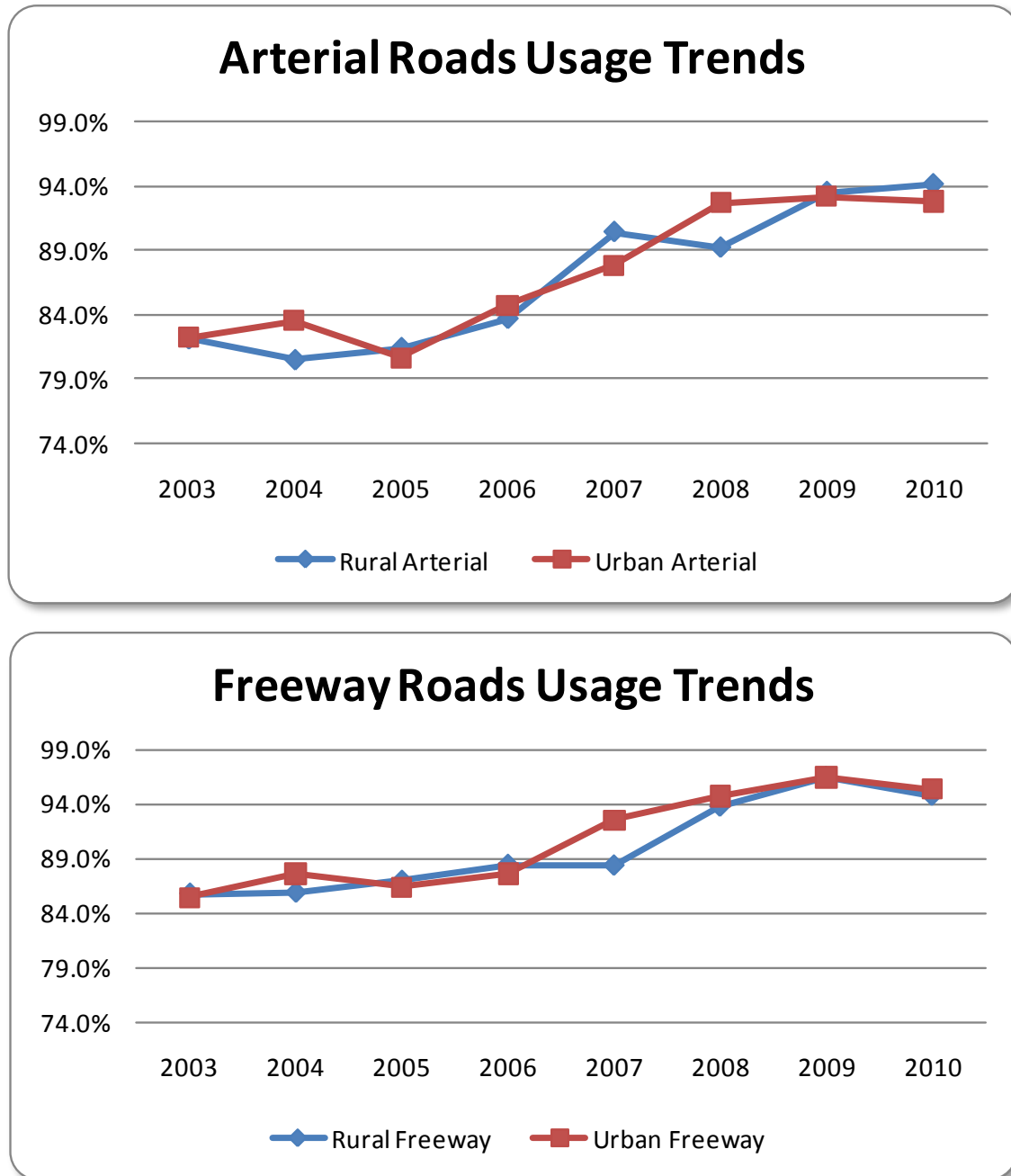


Figure 6 - Freeway and Arterial Roads Usage Trends

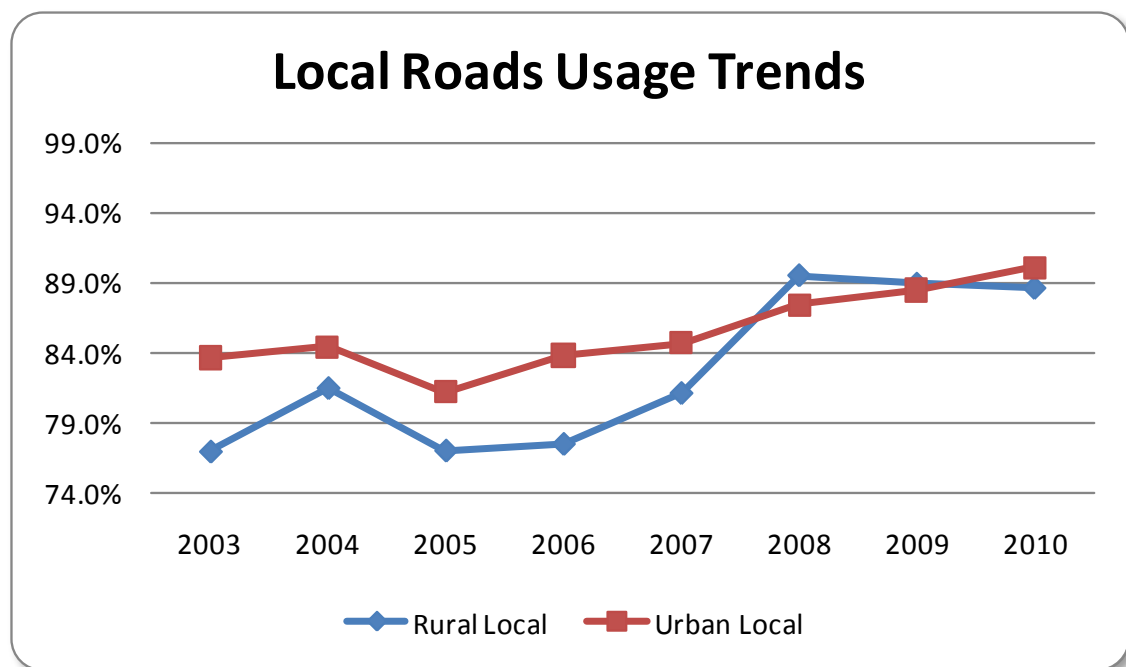
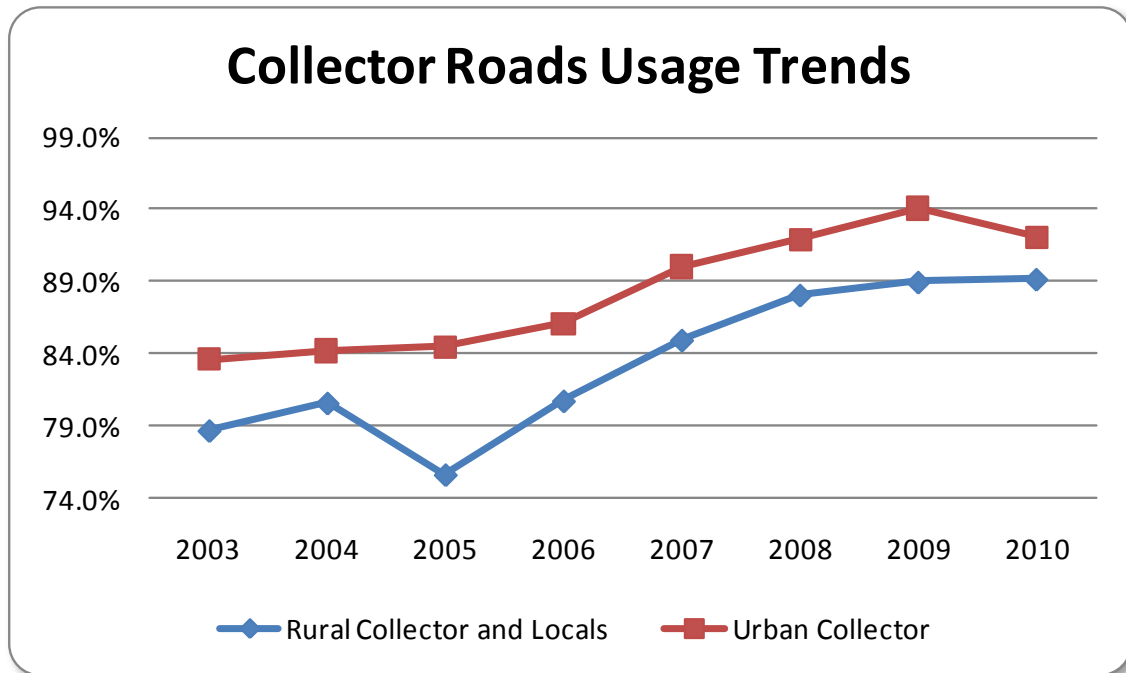


Figure 5 (continuation) - Collector and Local Roads Usage Rates

Historically, rural collectors and local roads have shown substantially lower usage rates than their urban counterparts. While rural collectors followed that trend, the usage rates on rural local roads surpassed the usage rates on urban local roads in 2008 for the first time. Unfortunately, 2009 and 2010 saw the trend revert back, with rural local roads once again exhibiting lower usage rates than their urban counterparts.

Seatbelt usage was observed at 26 freeway sites, 44 arterial road sites, and 43 collector and local road sites. The site-to-site variability of the usage rates depends on the road classification, with freeways usually showing the lowest variability and collector and local roads showing the highest. The Box-Whiskers plots in Figure 6 capture the variability of the usage rates for each road class in each year of the 2003-2010 period. The bottom whisker (lowest horizontal line) indicates the usage rate which is not exceeded at 1 % of sites, the bottom of the box indicates the usage rate which is not exceeded at 25% of sites. The point inside the box corresponds to 50% of sites, the top of the box to 75% of sites, and the upper whisker to 99% of sites.

To demonstrate the different levels of variability, the results are presented by road class: 26 sites represent freeways, 44 sites represent arterial roads, and 43 sites represent the collector and local roads. In 2010, rural arterials displayed smaller variability than in previous years. Urban collector and local roads also displayed lower variability. Rural local roads presented a similar variability of the usage rates across the studied sites to that of 2009. Freeways kept their variability levels similar to those of 2009. It should be noted that the measured variability may include additional variability caused by observers' measurement bias.



## Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use

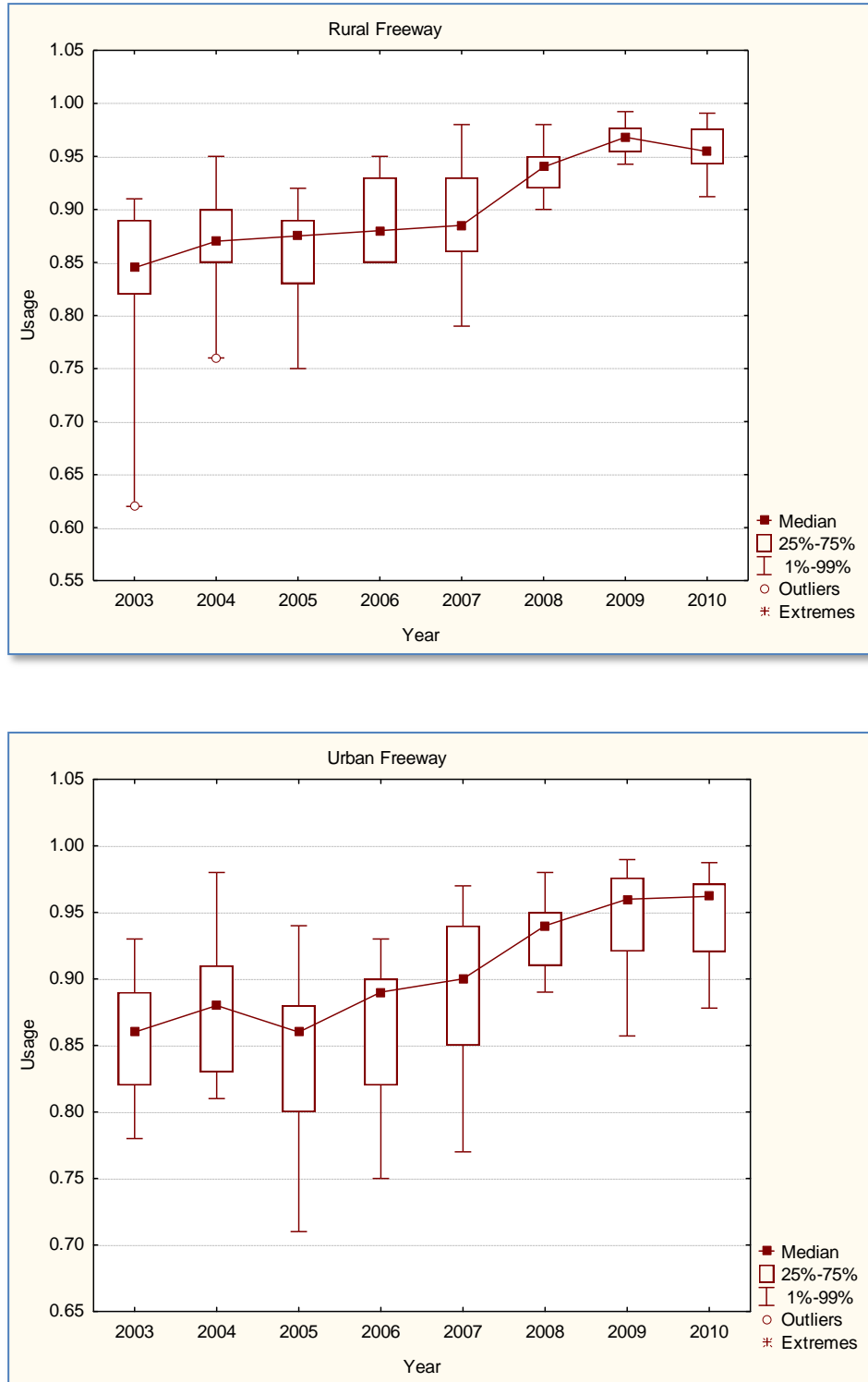


Figure 6 - Usage Rate Variability by Road Class

## Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use

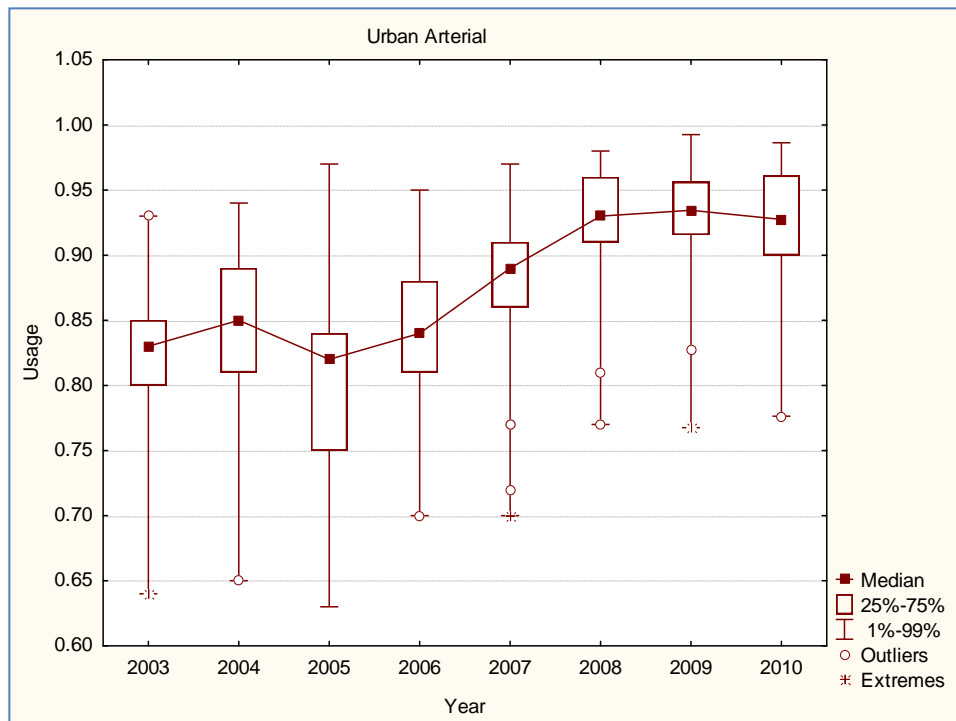
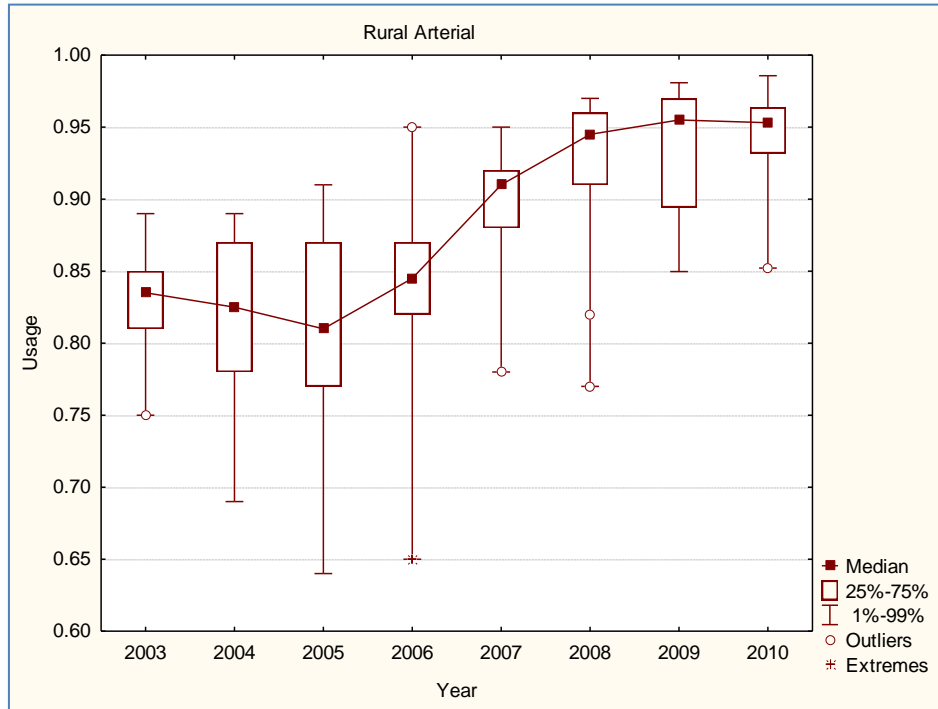


Figure 6 (continuation) - Usage Rate Variability by Road Class

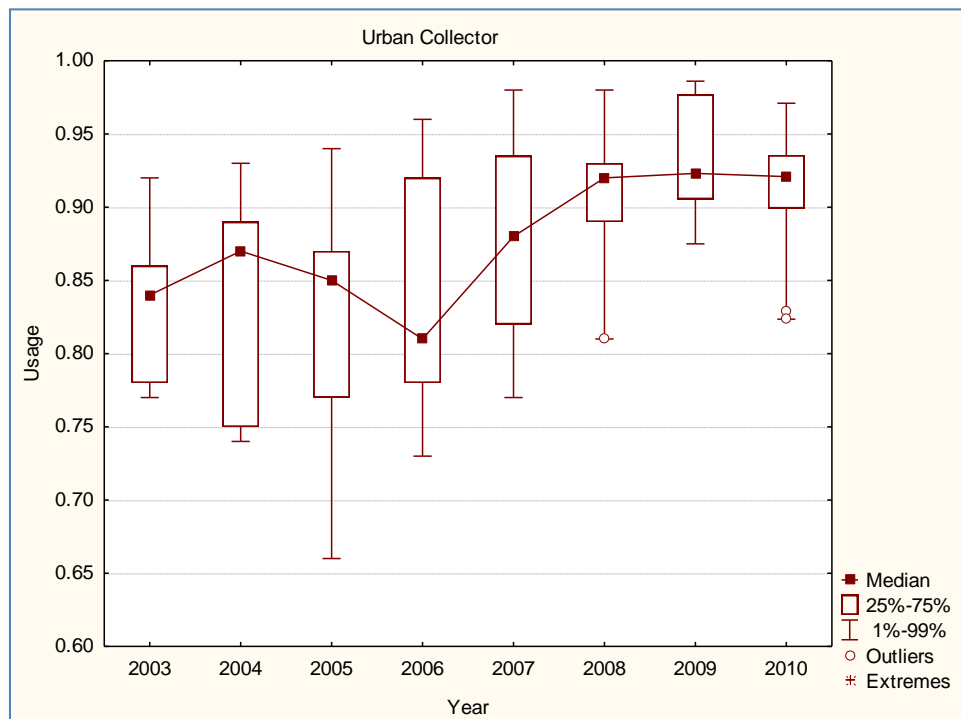
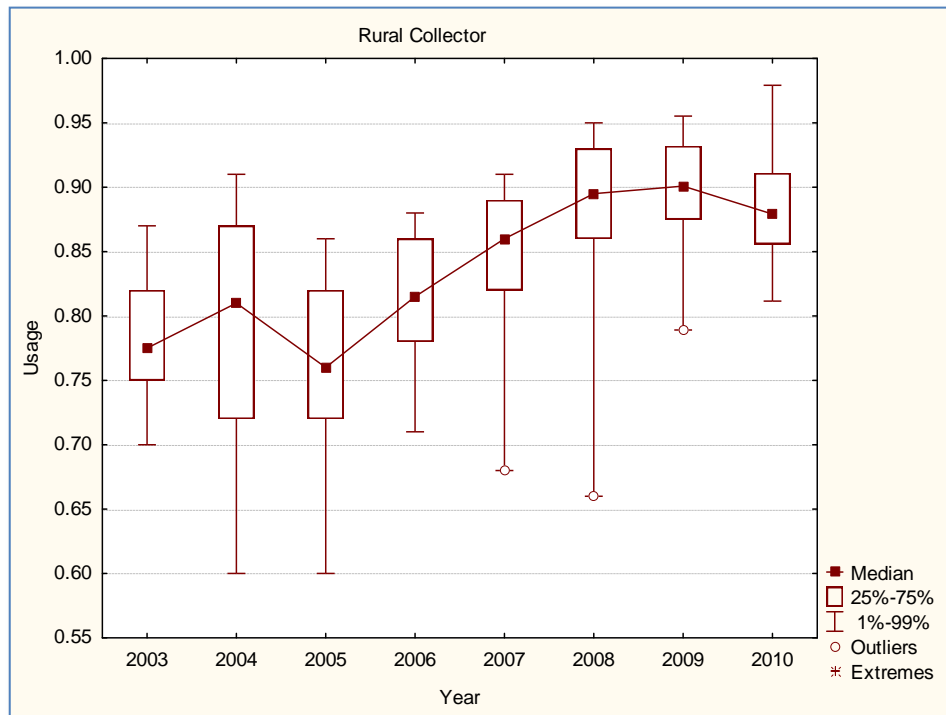


Figure 6 (continuation) - Usage Rate Variability by Road Class

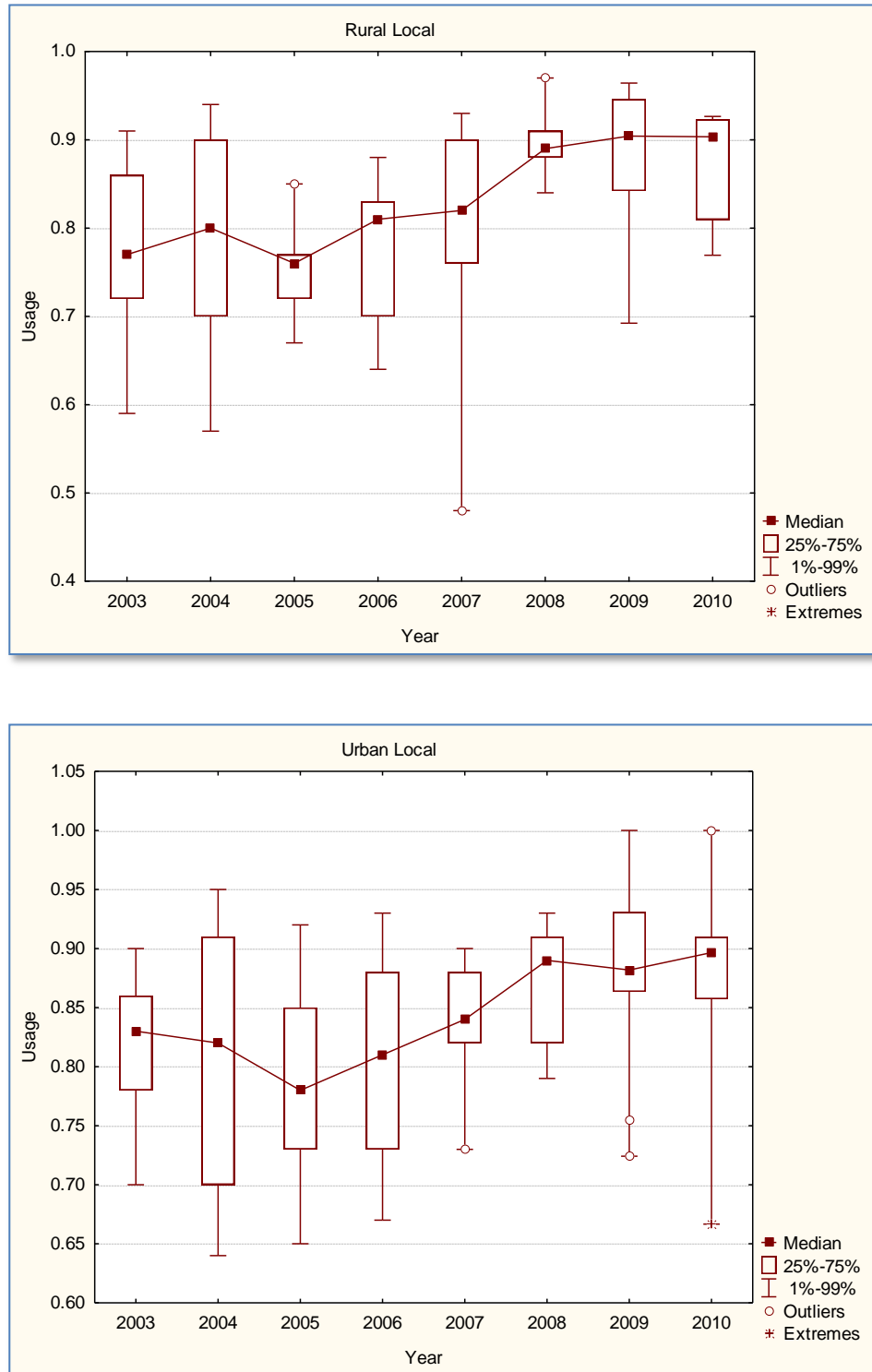


Figure 6 (continuation) - Usage Rate Variability by Road Class

## Usage by Gender, Age and Vehicle Type

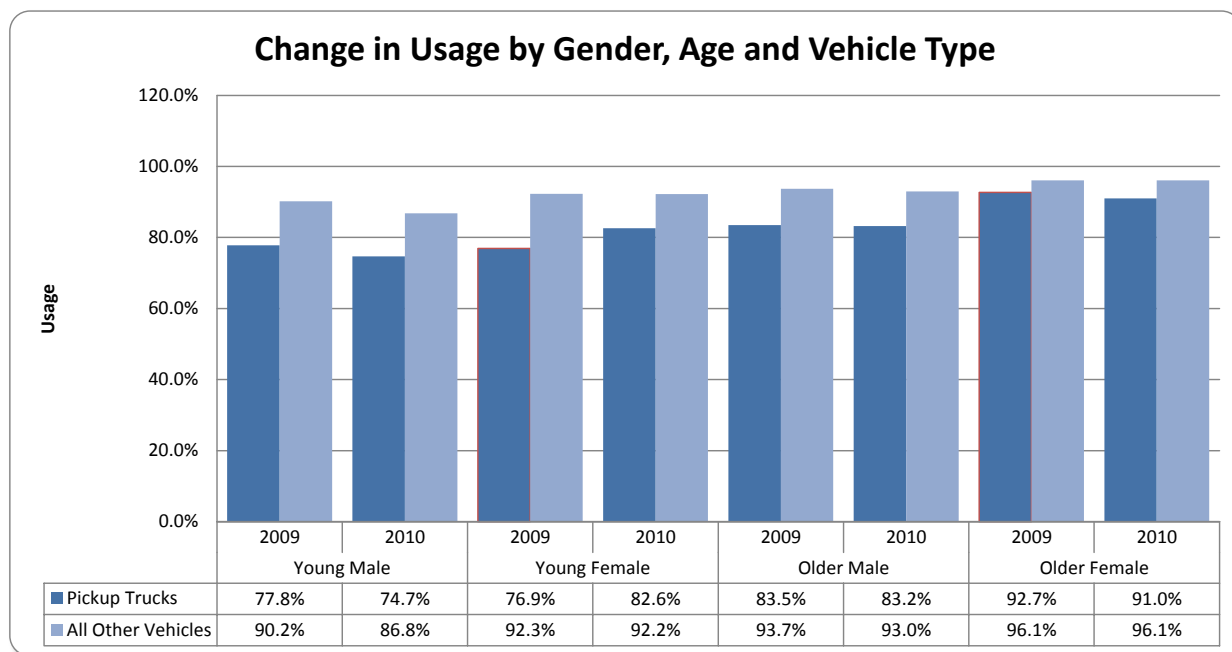


Figure 7 - Change in Usage by Gender, Age and Vehicle Type

Historically, there has been higher observed usage by female drivers and female passengers than by their male counterparts. In the 2010 survey the difference in usage rates between the genders was 7.1 percent, up from 4.9 percent in 2009 but down from 11 percent in 2006. As usage rates increase, it would be expected that the difference between genders will narrow and eventually disappear.

The usage rate for male pickup truck occupants has the largest room for growth and, as expected, has exhibited a considerable increase. In 2010, the usage rates of young female occupants of pickup trucks declined by 19%, after the exceptionally high increase of 33.7 percent, from 62.5 percent in 2007 to 96.2 percent in 2009. Young male occupants of pickup trucks, which had a usage rate of 69.4 percent in 2009, had a substantial increase of 8.4 percent in 2010, bringing their usage rate to 77.8 percent. This rate is very similar to the present usage rates of young females. Older male pickup truck occupants also had a large rate increase (6.3 percent). Nevertheless, older females still have higher usage rates (92.7 percent) than older males (82.5 percent.) The usage rate for females in pickup trucks now almost matches the usage rate for passenger vehicles (cars, vans, and SUVs).

The change in usage rates for older male and female occupants of all other vehicles were very small, between -0.2 and 1.1 percent.

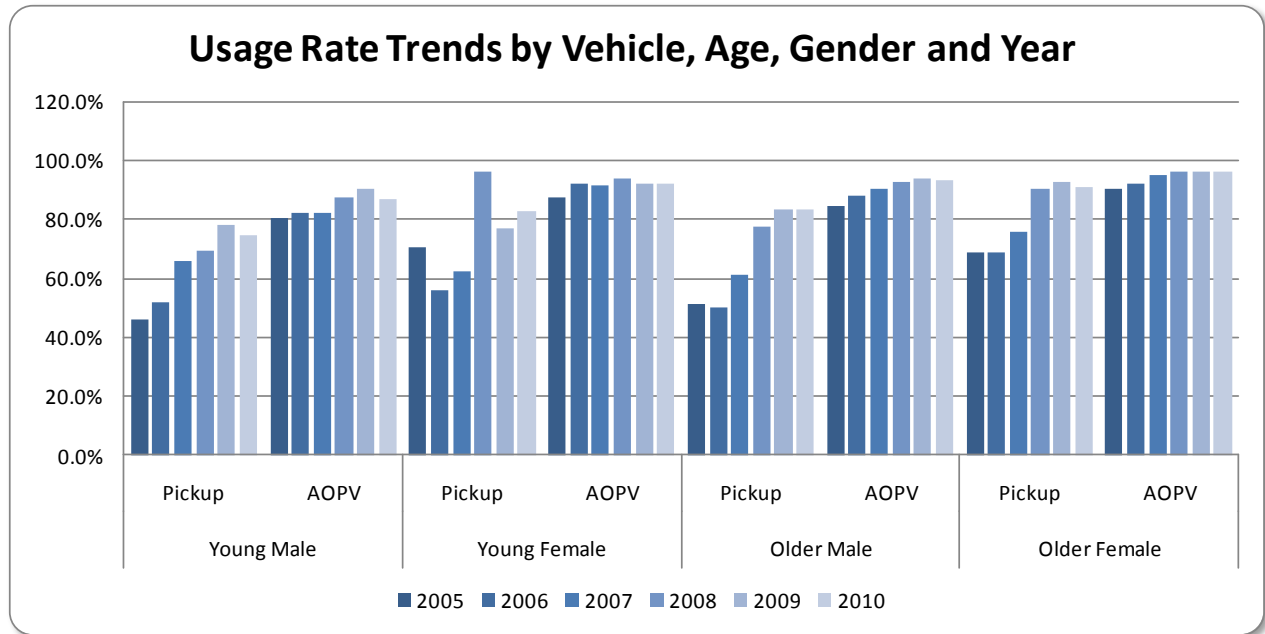


Figure 8 - Usage Rate Trends by Vehicle Type, Age, and Gender

Although the comparisons to the 2009 values have shown a large increase in the pickup truck rates for all ages and genders, it is helpful to analyze the trends in longer terms. The rates for young females in pickup trucks have exhibited high variability from year to year. A large decrease occurred in 2010, after a large increase in 2009, so maintaining the enforcement effort may prevent an undesirable reversal of the trend in the future. The current rates for female pickup truck occupant are once again below the 2003 usage rates for females in other vehicles. Usage rates for young males in pickup trucks, on the other hand, are above the 2003 usage rates for other vehicles. The usage rates for older males in pickup trucks are the same as the 2005 values. Males, in general, have shown more resistance to using safety belts than females. If the usage rates for males in pickup trucks follow a trend similar to the trend for other vehicles, it will take additional four to five years to bring the usage rate for young males in pickup trucks close to 90%. Enforcement may play a significant role in achieving this objective.

Table 1 presents the rates for vehicle occupants, broken down by gender, vehicle type, and role (driver/passenger.) The table presents the results aggregated for the state and for each of the three regions. It is important to notice that because of the multi-layered nature of this table, the rates cannot be weighted, and on occasion, may differ slightly from the official state numbers.

# Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use

**Table 2 - Usage Rate by Vehicle Type, Gender, Role and Region**

Indiana (113 sites)									
(June) Survey - Click It or Ticket (2010)									
by Vehicle Type, Gender and Role									
	All Drivers				Front-Seat Passengers				Both
Vehicle Type	R	NR	Percent		R	NR	Percent		Percent
			U	Restrained			U	Restrained	Restrained
Cars	7,449	434	70	94.5%	1,404	88	57	94.1%	94.4%
Pickup Trucks	2,574	472	48	84.5%	455	87	18	83.9%	84.4%
Minivans	1,891	98	9	95.1%	551	26	10	95.5%	95.2%
Large Vans	224	38	13	85.5%	48	10	2	82.8%	85.0%
SUV	3,473	218	33	94.1%	735	33	22	95.7%	94.4%
Commercial	1,011	145	45	87.5%	34	19	7	64.2%	86.4%
All Vehicles	16,622	1,405	218	92.2%	3,227	263	116	92.5%	92.2%
Without Commercial Vehicle	15,611	1,260	173	92.5%	3,193	244	109	92.9%	92.6%
	Female Drivers				Female Front-Seat Passengers				Both
Cars	3,600	157	37	95.8%	963	45	35	95.5%	95.8%
Pickup Trucks	307	24	5	92.7%	264	34	8	88.6%	90.8%
Minivans	1,063	41	5	96.3%	386	15	7	96.3%	96.3%
Large Vans	32	4	1	88.9%	29	2	0	93.5%	91.0%
SUV	1,819	88	13	95.4%	513	16	10	97.0%	95.7%
Commercial	33	0	0	100.0%	5	3	0	62.5%	92.7%
All Vehicles	6,854	314	61	95.6%	2,160	115	60	94.9%	95.5%
Without Commercial Vehicle	6,821	314	61	95.6%	2,155	112	60	95.1%	95.5%
	Male Drivers				Male Front-Seat Passengers				Both
Cars	3,830	276	29	93.3%	431	42	18	91.1%	93.1%
Pickup Trucks	2,256	448	41	83.4%	188	52	7	78.3%	83.0%
Minivans	824	57	4	93.5%	161	11	2	93.6%	93.5%
Large Vans	191	34	12	84.9%	19	8	1	70.4%	83.3%
SUV	1,645	130	18	92.7%	218	17	9	92.8%	92.7%
Commercial	978	145	45	87.1%	29	16	6	64.4%	86.2%
All Vehicles	9,724	1,090	149	89.9%	1,046	146	43	87.8%	89.7%
Without Commercial Vehicle	8,746	945	104	90.2%	1,017	130	37	88.7%	90.1%

Table 2s are raw unweighted numbers.

Indiana North Region (June) Survey - Click It or Ticket (2010)									
by Vehicle Type, Gender and Role									
Vehicle Type	All Drivers				Front-Seat Passengers			Both	
	R	NR	Percent		R	NR	Percent		Percent
			U Restrained				U Restrained		
Cars	2,089	92	30	95.8%	298	16	19	94.9%	95.7%
Pickup Trucks	715	118	16	85.8%	106	18	9	85.5%	85.8%
Minivans	564	24	3	95.9%	127	12	3	91.4%	95.0%
Large Vans	73	7	8	91.3%	10	1	0	90.9%	91.2%
SUV	895	46	8	95.1%	157	6	10	96.3%	95.3%
Commercial	335	33	22	91.0%	7	5	3	58.3%	90.0%
All Vehicles	4,671	320	87	93.6%	705	58	44	92.4%	93.4%
Without Commercial Vehicle	4,336	287	65	93.8%	698	53	41	92.9%	93.7%
Vehicle Type	Female Drivers				Female Front-Seat Passengers			Both	
	R	NR	Percent		R	NR	Percent		Percent
			U Restrained				U Restrained		
Cars	1,058	35	15	96.8%	194	7	16	96.5%	96.8%
Pickup Trucks	92	6	2	93.9%	56	4	3	93.3%	93.7%
Minivans	330	9	1	97.3%	90	8	2	91.8%	96.1%
Large Vans	11	1	1	91.7%	6	0	0	100.0%	94.4%
SUV	445	13	4	97.2%	111	1	7	99.1%	97.5%
Commercial	11	0	0	100.0%	0	2	0	0.0%	84.6%
All Vehicles	1,947	64	23	96.8%	457	22	28	95.4%	96.5%
Without Commercial Vehicle	1,936	64	23	96.8%	457	20	28	95.8%	96.6%
Vehicle Type	Male Drivers				Male Front-Seat Passengers			Both	
	R	NR	Percent		R	NR	Percent		Percent
			U Restrained				U Restrained		
Cars	1,017	57	12	94.7%	99	9	2	91.7%	94.4%
Pickup Trucks	619	112	13	84.7%	49	14	5	77.8%	84.1%
Minivans	230	15	2	93.9%	36	4	1	90.0%	93.3%
Large Vans	61	6	7	91.0%	4	1	0	80.0%	90.3%
SUV	444	33	3	93.1%	43	5	2	89.6%	92.8%
Commercial	324	33	22	90.8%	7	3	2	70.0%	90.2%
All Vehicles	2,695	256	59	91.3%	238	36	12	86.9%	90.9%
Without Commercial Vehicle	2,371	223	37	91.4%	231	33	10	87.5%	91.0%

Table 2s are raw unweighted numbers.

# Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use

**Table 2 (continuation) - Usage Rate by Vehicle Type, Gender, Role and Region**

Indiana Central Region (June) Survey - Click It or Ticket (2010)									
by Vehicle Type, Gender and Role									
Vehicle Type	All Drivers				Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	1,820	102	2	94.7%	442	24	1	94.8%	94.7%
Pickup Trucks	588	98	3	85.7%	132	27	0	83.0%	85.2%
Minivans	369	15	0	96.1%	129	4	0	97.0%	96.3%
Large Vans	30	10	0	75.0%	15	2	0	88.2%	78.9%
SUV	826	43	1	95.1%	226	7	0	97.0%	95.5%
Commercial	160	21	0	88.4%	6	2	0	75.0%	87.8%
All Vehicles	3,793	289	6	92.9%	950	66	1	93.5%	93.0%
Without Commercial Vehicle	3,633	268	6	93.1%	944	64	1	93.7%	93.2%
Vehicle Type	Female Drivers				Female Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	811	38	1	95.5%	310	14	0	95.7%	95.6%
Pickup Trucks	74	5	0	93.7%	81	14	0	85.3%	89.1%
Minivans	183	6	0	96.8%	96	0	0	100.0%	97.9%
Large Vans	7	2	0	77.8%	9	1	0	90.0%	84.2%
SUV	409	13	0	96.9%	170	6	0	96.6%	96.8%
Commercial	5	0	0	100.0%	1	0	0	100.0%	100.0%
All Vehicles	1,489	64	1	95.9%	667	35	0	95.0%	95.6%
Without Commercial Vehicle	1,484	64	1	95.9%	666	35	0	95.0%	95.6%
Vehicle Type	Male Drivers				Male Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	1,009	64	1	94.0%	131	10	1	92.9%	93.9%
Pickup Trucks	514	93	2	84.7%	51	13	0	79.7%	84.2%
Minivans	186	9	0	95.4%	32	4	0	88.9%	94.4%
Large Vans	23	8	0	74.2%	6	1	0	85.7%	76.3%
SUV	417	30	1	93.3%	56	1	0	98.2%	93.8%
Commercial	155	21	0	88.1%	5	2	0	71.4%	87.4%
All Vehicles	2,304	225	4	91.1%	281	31	1	90.1%	91.0%
Without Commercial Vehicle	2,149	204	4	91.3%	276	29	1	90.5%	91.2%

Table 2s are raw unweighted numbers.

Indiana South Region (June) Survey - Click It or Ticket (2010)									
by Vehicle Type, Gender and Role									
Vehicle Type	All Drivers				Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	1,008	60	5	94.4%	300	22	5	93.2%	94.1%
Pickup Trucks	440	107	8	80.4%	100	26	3	79.4%	80.2%
Minivans	265	23	0	92.0%	124	2	1	98.4%	94.0%
Large Vans	42	11	2	79.2%	10	3	0	76.9%	78.8%
SUV	524	39	10	93.1%	153	11	2	93.3%	93.1%
Commercial	139	41	11	77.2%	9	7	2	56.3%	75.5%
All Vehicles	2,418	281	36	89.6%	696	71	13	90.7%	89.8%
Without Commercial Vehicle	2,279	240	25	90.5%	687	64	11	91.5%	90.7%
Vehicle Type	Female Drivers				Female Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	475	22	3	95.6%	214	13	2	94.3%	95.2%
Pickup Trucks	50	5	1	90.9%	58	7	3	89.2%	90.0%
Minivans	148	9	0	94.3%	89	2	1	97.8%	95.6%
Large Vans	4	0	0	100.0%	9	1	0	90.0%	92.9%
SUV	283	16	3	94.6%	106	6	0	94.6%	94.6%
Commercial	4	0	0	100.0%	3	1	0	75.0%	87.5%
All Vehicles	964	52	7	94.9%	479	30	6	94.1%	94.6%
Without Commercial Vehicle	960	52	7	94.9%	476	29	6	94.3%	94.7%
Vehicle Type	Male Drivers				Male Front-Seat Passengers				Both
	R	NR	U	Percent Restrained	R	NR	U	Percent Restrained	Percent Restrained
Cars	533	37	2	93.5%	85	9	3	90.4%	93.1%
Pickup Trucks	389	102	7	79.2%	42	19	0	68.9%	78.1%
Minivans	117	14	0	89.3%	35	0	0	100.0%	91.6%
Large Vans	38	11	2	77.6%	1	2	0	33.3%	75.0%
SUV	241	23	6	91.3%	47	5	1	90.4%	91.1%
Commercial	135	41	11	76.7%	6	6	2	50.0%	75.0%
All Vehicles	1,453	228	28	86.4%	216	41	6	84.0%	86.1%
Without Commercial Vehicle	1,318	187	17	87.6%	210	35	4	85.7%	87.3%

Table 2s are raw unweighted numbers.



## Interaction between driver and passenger usage, by age and gender

Analysis of the Indiana past seatbelt usage data indicates that occupants of the same vehicle may influence the behavior of others in the vehicle. This interaction, demonstrated in Figure 9, may help in determining future efforts to increase the safety belts usage. It has been found that when the vehicle has an older driver who is wearing a safety belt, then 96.6 percent of older and 96.0 percent of young passengers also wear a safety belt. A similar effect is observed for a young driver wearing a safety belt. On the other hand, when a driver is not wearing a safety belt, then passengers show a much lower usage rate (25-50 percent). This pattern of behavior has been observed even though overall usage has been increasing.

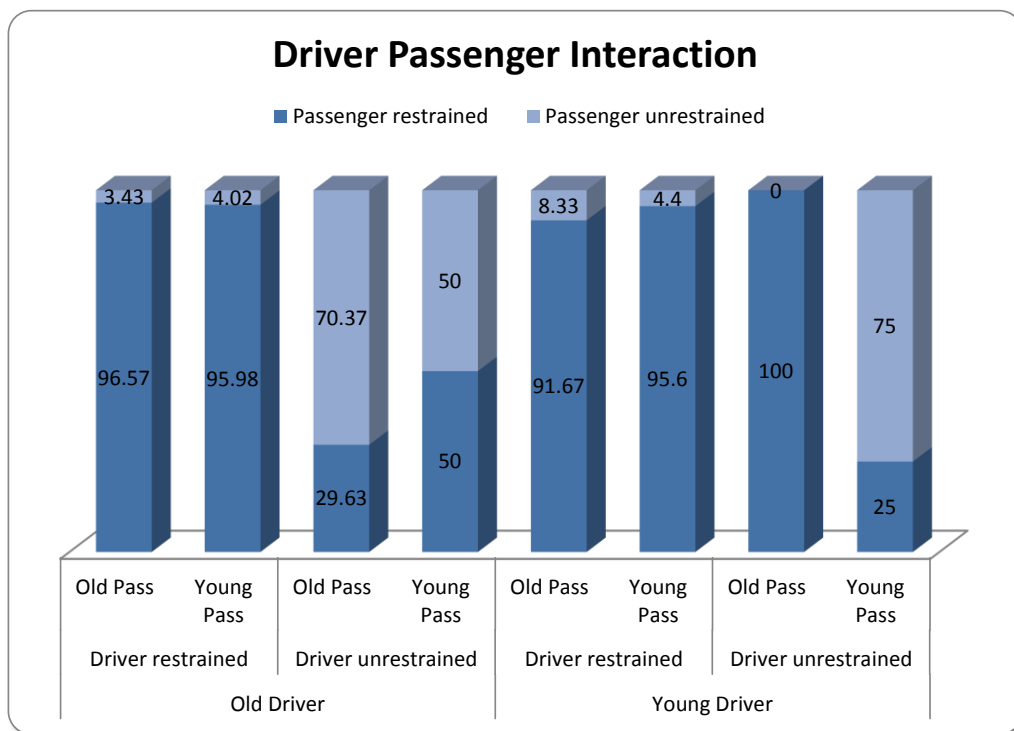


Figure 9 - Influence of Driver Usage Pattern on Passenger Usage

Although one would expect drivers to have an influence on the passengers in their vehicles, the decision of passengers whether or not to wear a restraint potentially can influence the driver's decision as well. Figure 10 shows the relationship between the age, the passenger safety belt usage rate, and the driver rate. The figure shows that when a young passenger is restrained, then a young driver is also restrained 97 percent of the time. If a young passenger is not restrained, then a young driver is restrained only 31.8 percent of the time. Both numbers are slightly lower than the 2009 rates, but the pattern remains identical. When an older passenger is present, whether restrained or not, young drivers are buckled up nearly always.

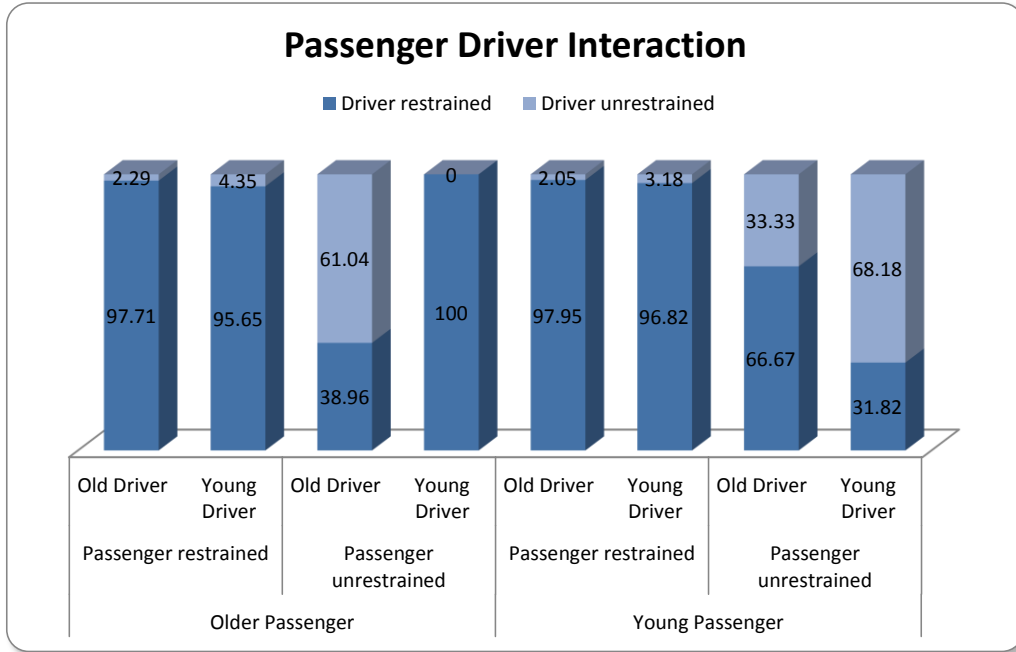


Figure 10 - Influence of Passenger Usage Pattern on Driver Usage

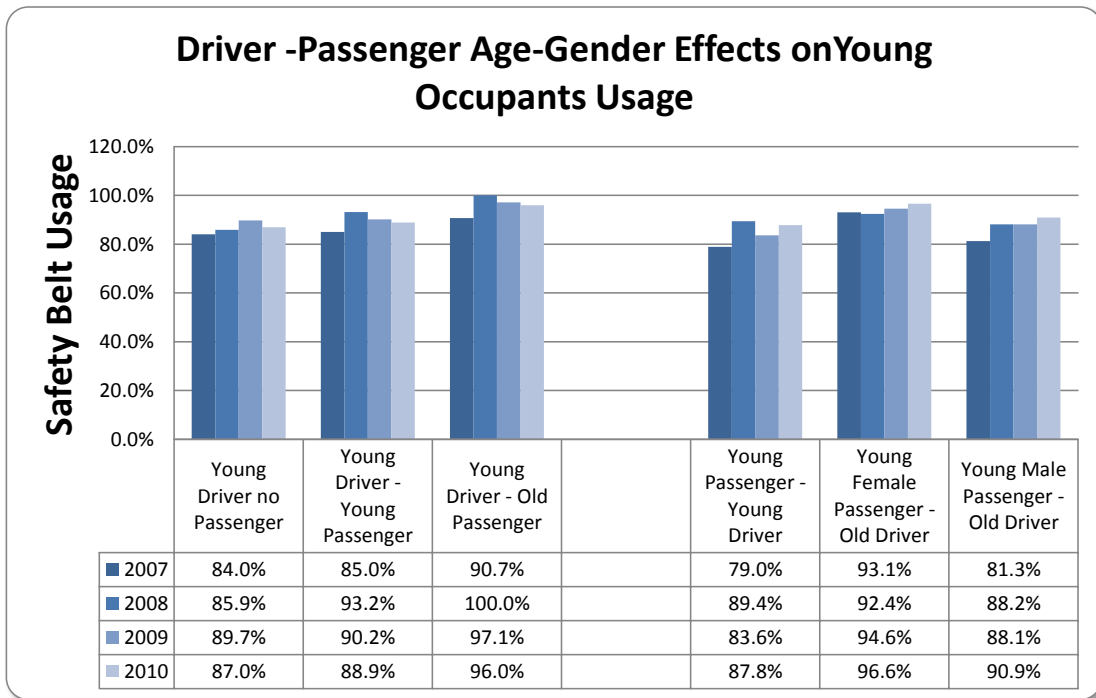


Figure 11 - Effect of Occupant Ages and Usage Rates

Figure 11 shows the effect of the difference in age between vehicles occupants on the usage rates of the younger ones. Young passengers have lower usage rates in the presence of young drivers than in the presence of older drivers. Similarly, the usage rates for young drivers in the presence of an older passenger are around 7 percent higher than when alone or in the presence of another young passenger. It is important to notice that a young driver without passengers has the lowest usage rate among all the cases. This seems to indicate that being a driver adds an extras sense of responsibility for the safety of passengers and motivates some young drivers to overcome peer pressure.

## Motorcycle Helmet Usage Rates

Only persons under the age of 18 are required to wear helmets while operating a motorcycle on Indiana streets and highways. The overall motorcycle helmet usage rate for 2010 was 38.9 percent, lower than the rates of 2009 and 2007, and close to the 38.8 percent seen in 2005. A total number of 316 motorcycle operators and passengers were observed during the 2010 study. Data collected for 98 motorcyclists (operators and passengers) in the north region indicate the helmet usage rate of 41.8 percent. In the central region, 38.7 percent of 111 observed motorcyclists used helmet, and 36.5 percent of 107 motorcyclists observed in the south region were wearing helmets. Motorcycle data were collected only at the assigned sites and not during transit from one site to another as in some previous surveys. This change was made to avoid the distraction and difficulty in determining the road classification.

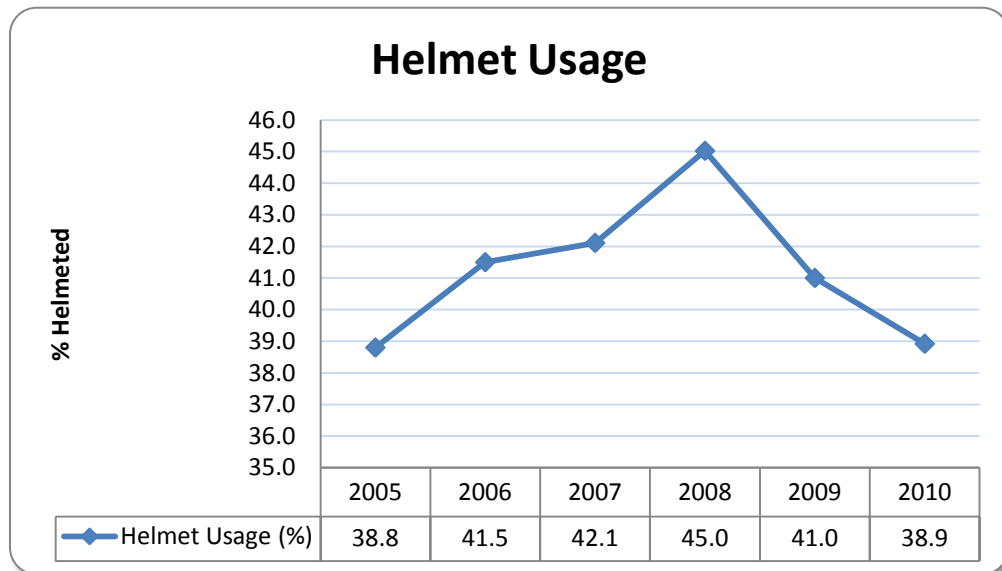


Figure 13 - Yearly Helmet Usage Rates

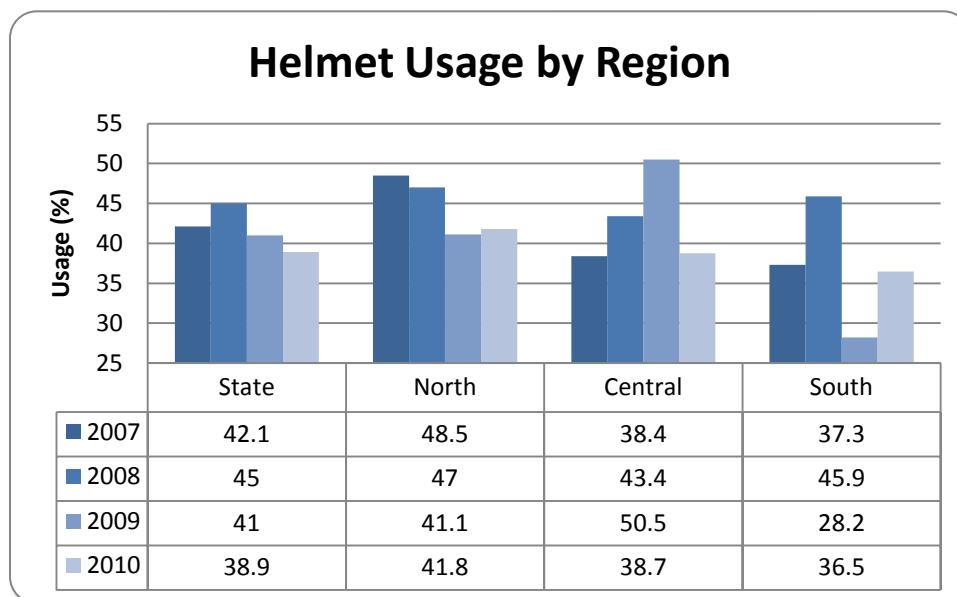


Figure 14 - Helmet Usage Rates by Region

## Cellular Phone Usage

The usage of cellular phones and other electronic devices while driving has been on the rise in recent years with a negative effect on traffic safety. Research by the Insurance Institute for Highway Safety suggests that using a cellular phone when driving quadruples the risk of an incapacitating injury crash. These factors created an interest in monitoring cell phone usage while driving, and the current observational safety belt surveys offered an excellent opportunity to collect such data. Consequently, starting in December 2009, data on cellular phone usage were collected together with the seatbelt usage data by the same observers.

Data collected in June 2010 (Table 3) shows that 5.3 percent of restrained drivers were using cell phones, about the same (5.0 percent) observed in December 2009. Only about four percent of non-restrained drivers were using cell phones, down from the 7.4 percent observed in December 2009.

Car and pickup truck drivers exhibited similar cell phone usage rates, 4.9 and 4.7 percent respectively (Table 4), and SUVs and mini-van drivers presented the highest cell phone usage rates, slightly over 6.0 percent. In the June survey, there was no major difference between young and adult drivers, but female driver usage of cell phones was almost 70 percent higher than the rate for male drivers. Female usage was 6.8 percent, whereas male usage was only 4.1 percent.

**Table 3: Cell phone use by restraint use**

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
Not restrained	1545	96.1	62	3.9
Restrained	16320	94.7	907	5.3
Unknown	193	87.7	27	12.3

**Table 4: Cell phone use by vehicle type**

Vehicle	No cell		Cell	
	Counts	%	Counts	%
Car	7741	95.1	398	4.9
Motorcycle	267	100.0	0	0.0
Commercial	1125	95.7	51	4.3
Pickups	2997	95.3	148	4.7
Vans	1910	94.0	123	6.1
Large Vans	251	94.7	14	5.3
SUV	3574	93.8	235	6.2

**Table 5: Cell phone use by age**

Driver Age	No cell		Cell	
	Counts	%	Counts	%
Adult	17092	94.9	921	5.1
Young	770	94.3	47	5.8
Unknown	3	75.0	1	25.0

**Table6: Cell phone use by gender**

Driver gender	No cell		Cell	
	Counts	%	Counts	%
Female	6889	93.2	505	6.8
Male	10938	96.0	462	4.1
Unknown	38	95.0	2	5.0

## Conclusions and Recommendations

The June 2010 observational safety belt survey indicates that Indiana, at its 92.4 percent usage rate, has almost duplicated last year's record high overall usage rate, which is well above the 2009 national average of 84 percent. Since 2008, Indiana is one of only 17 states that have safety belt usage rates at or above 90 percent. Indiana continues its efforts to enforce the primary safety belt legislation introduced in 2007 that has removed the pickup truck loophole by mandating seat belt usage for all vehicle occupants.

Once the usage rates began to exceed the 90 percent value, a further increase has been hard to attain. Identifying and targeting the Indiana areas with the highest potential for improvement should be the strategy to keep the upward trend in the future.

Eliminated in 2009, the long standing differences in seatbelts usage between the northern, central, and southern regions have resurfaced. The usage rates in the southern region are again lagging behind the other two regions.

Females continue to display restraint usage rates higher than the rates of males; and despite the large increase, the pickup truck rates still lag behind those of cars by approximately 10 percent. Young male occupants of pickups are still the group with the greatest potential for improvement.

Urban local roads continue to exhibit a robust increase in seat belt usage rates. Rural collectors still lag behind their urban counterparts. Local roads (especially rural local pickup truck usage) continue to have the lowest usage rates of all road classifications. Enhancing enforcement on these roads could have a favorable impact on the state overall usage rate.

Finally, the presence of an older passenger has consistently exhibited a positive effect on safety belt usage among young drivers. It is important to encourage parents and other adults to be present in vehicles with young drivers as they develop their driving habits.

One should always remember that increased safety belt usage rates lead not only to positive traffic safety statistics, but more importantly, they have a direct impact on reducing the number of fatalities and the severity of injuries on Indiana roads.

## **Appendix A – Indiana Seatbelt Survey History**

## Survey History

The 2010 Indiana Roadside Observation Survey of Safety Belt Use was the 36<sup>rd</sup> in a series of surveys originally designed in 1985. The first through 17<sup>th</sup> surveys (1986 through 1993) were all conducted using a common protocol. In 1994, the survey was redesigned in conformance with guidelines published in the *Federal Register* [vol. 57, no. 125, June 2, 1992: 2889928904] by NHTSA; the revised design was discussed in the 1994 report. A review of the 1994 survey design was conducted prior to the 1998 survey for all states through the NHTSA regional offices. For 1994 and earlier surveys, reporting was restricted to passenger cars. In 1995, the survey was modified to permit reporting for a wider variety of vehicle types, including minivans, SUVs, and pickup trucks. Large passenger vans were included for the first time in the 1998 survey as required by new NHTSA regulations. The spring 2000, 103-site survey used a proportional, random sample of the sites used for the 1998 and 1999 survey. All vehicles identified as commercial have been excluded in each of the surveys through 2000. The 2001 survey included commercial vehicles for the first time, with the exception of semi-tractor trailers and other large trucks with a gross vehicle weight greater than 10,000 pounds.

NHTSA permits states to exclude counties comprising up to 15 percent of the lowest population density from their surveys. The effect of excluding low-population counties on Indiana's weighted usage rate estimates has been examined. The 2000 US Census Bureau estimates of Indiana county populations were used. Eight previously surveyed counties (Perry, Fountain, Tipton, Newton, Decatur, Ripley, Daviess and Franklin) were determined to be low-population counties and could be excluded. This reduced the total number of sites by 24 to 79 sites. Appropriate vehicle miles of travel (VMT) weights were adjusted to account for this exclusion.

The NHTSA-approved design was employed in 2000 to 79 sites. Sixteen counties were clustered into two groups (eight urban and eight rural counties). NHTSA also allowed combining local and collector roads into one rural category and one urban category for analysis purposes.

Prior to the September 2001 survey, a thorough analysis of the survey design was conducted. As a result, it was recommended that the number of sites be increased in larger cities and counties to better represent their population. In addition, the number of survey sites was increased for road classifications that exhibited stronger variation for safety belt usage rates to improve the survey accuracy. The survey modifications increased the number of sites from 79 to 113, while continuing to exclude the lowest 15 percent population counties from the survey design. These modifications were submitted to NHTSA for their review and subsequent acceptance.

Regional analysis uses 35 sites in the north region, 20 sites in the central region, and 16 sites in the south region.

Beginning in 2003, usage rates were measured in each of Indiana's three regions (north, central, and south), using 71 of the 113 statewide sites plus four additional sites. This regional analysis uses 35 sites in the north region, 20 sites in the central region, and 16 sites in the south. A geographically-focused evaluation of Indiana's safety belt usage rate was found beneficial. The regional and statewide surveys continue to be conducted



concurrently and the regional sites have become a constant subset of the statewide survey.

Sites for the survey were clustered in a way that reduces the traveled distance by observers when visiting the sites. A start time and day of the week for visits were randomly assigned. Observations were collected on all days of the week. The collection day and time used in 1998 through 2000 for existing sites were retained whenever feasible. When scheduling constraints dictated a change in time or day, the proportion of sites assigned to weekend days, morning rush, evening rush, and midday time periods was maintained. Observation sessions were evenly distributed during daylight hours (between 7:00 AM and 7:30 PM). For the June 2010 survey, traffic was observed for exactly 45 minutes at each of the sites (the same observation protocol used since September 2000). Safety belt use was recorded for front-seat outboard occupants only (driver and right front passenger, if present). The formulas used to estimate the usage rates, standard deviations, and relative precision for the 2010 survey can be found in the 1998 report.

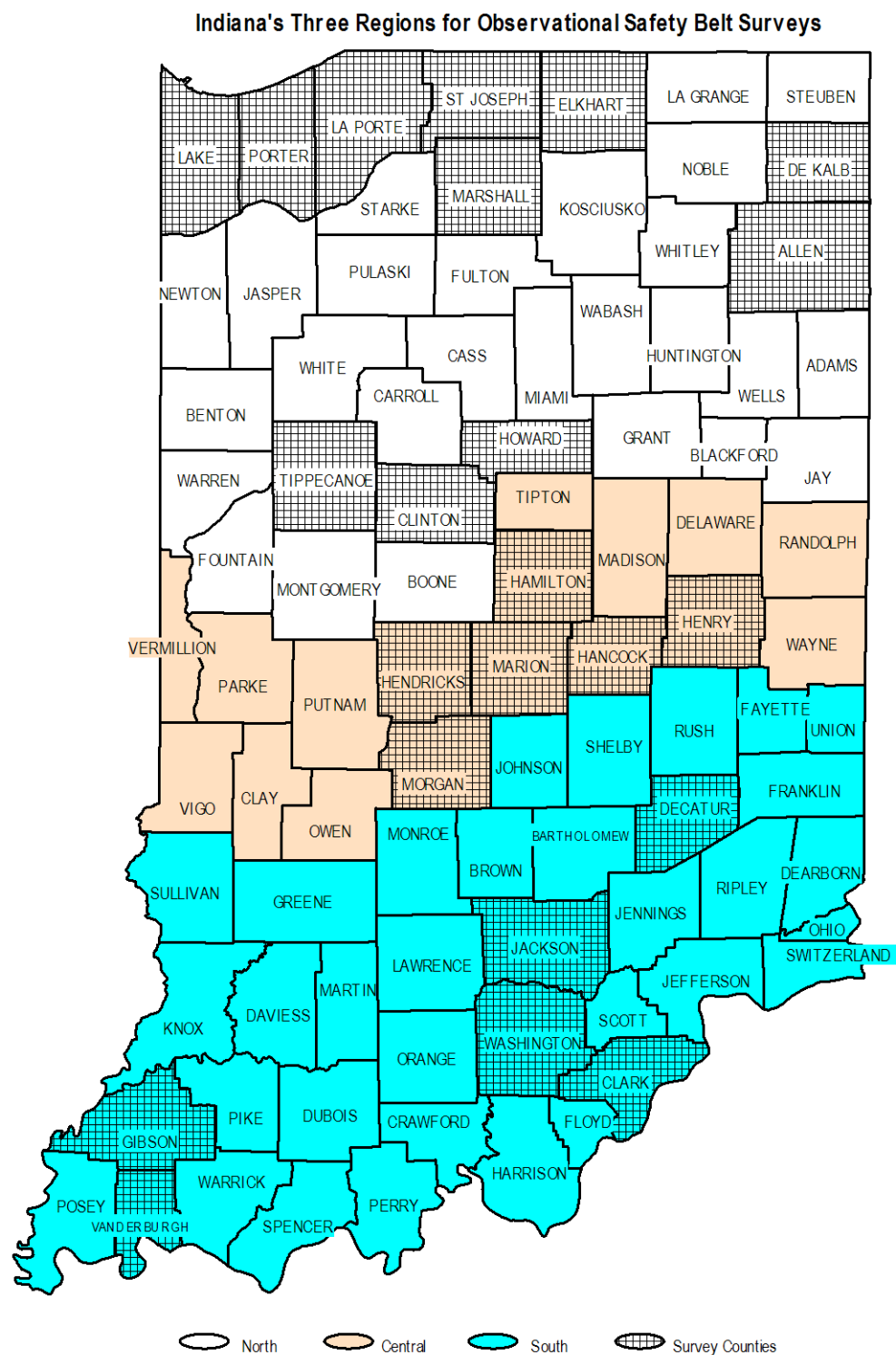
### Survey Design

Observations of commercial vehicles (vehicles of any body type clearly marked and used only for business purposes) were collected for the first time in the September 2001 survey and which have continued into 2010, using the same protocols as in previous years. In this report, Table 2 includes the reported results both with and without commercial vehicle observations.

The following counties are represented in the statewide survey and regional subset. The number in parentheses indicates the number of sites at which data were collected.

Allen (9)	Clark (4)	Clinton (2)	DeKalb (2)
Elkhart (7)	Gibson (4)	Hamilton (6)	Hancock (6)
Hendricks (6)	Henry (3)	Howard (5)	Jackson (6)
Lake (10)	LaPorte (8)	Marion (8)	Marshall (4)
Morgan (1)	Porter (7)	Tippecanoe (6)	Saint Joseph (3)
Vanderburgh (8)	Decatur (1)	Washington (1)	

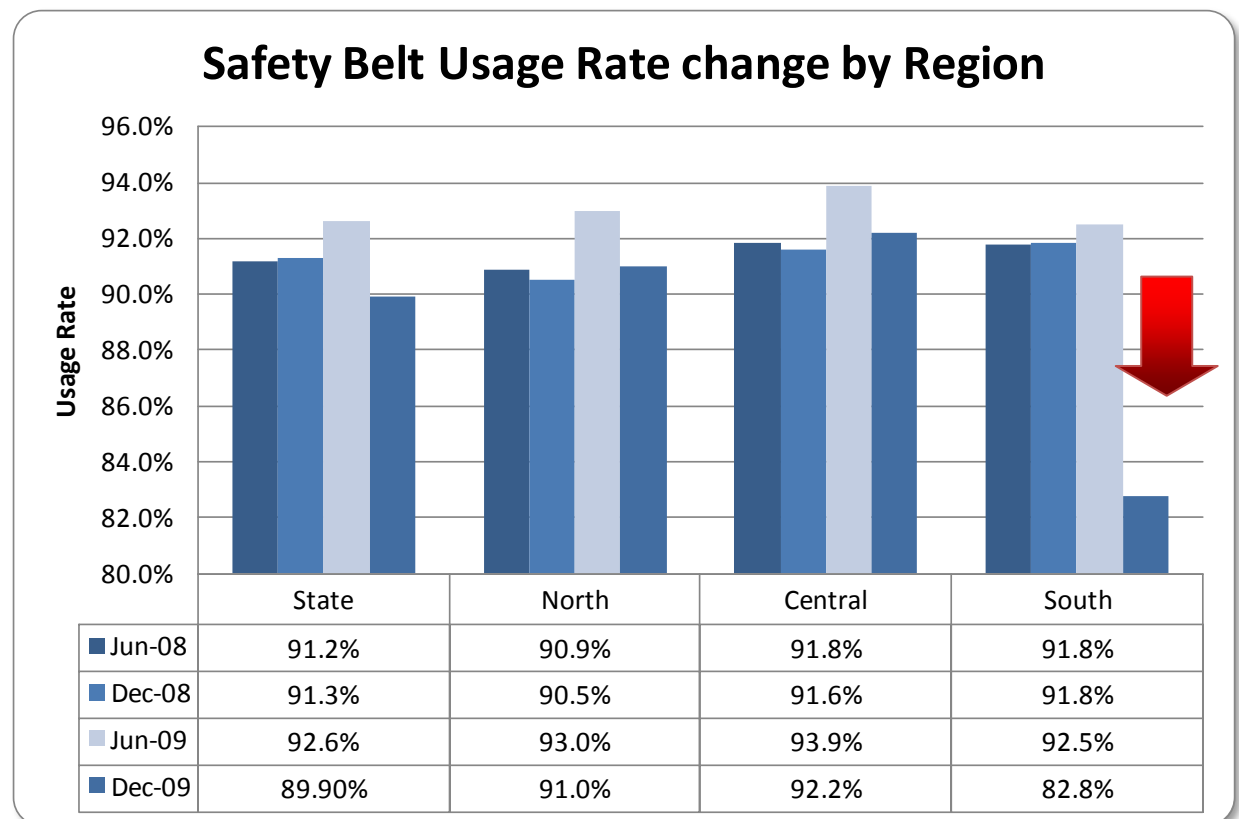
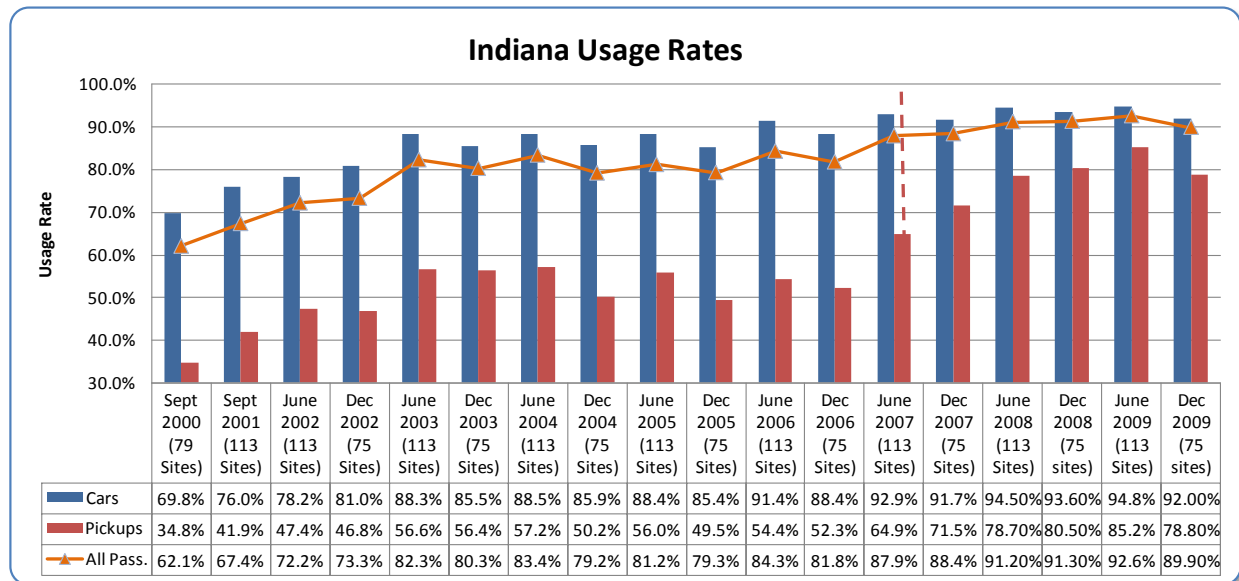
The map of Indiana illustrates the distribution of the observational survey sites throughout the state and its three regions. The three regions were originally designed to follow the Law Enforcement Liaison (LEL) areas of jurisdiction. However, the LEL counties of responsibility have changed over time and they no longer match the observational regions. Nonetheless, the observational survey regions have remained consistent with the original survey design.



### Figure A1 – Breakdown of Indiana Counties in Three Zones

## **Appendix B – Tables and Figures from the Indiana December 2009 Mini Survey**

## Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use



### Effect of Unknowns on Usage Rate

These two tables are intended to illustrate the effect of ignoring the unknowns when calculating the usage rate. "Unknown" should only be marked when, after significant effort, the observer cannot see a safety belt but is not completely sure the belt was not being used. Research has shown that in a large number of these cases, the occupant is indeed unbelted. The numbers presented assume all unknowns were not belted and thus represent the lower bound for the usage rates.

Region	Ignoring Unknowns	Assuming Unknowns as not belted
State	89.90%	88.80%
North	91.0%	86.90%
Central	92.2%	92.10%
South	82.8%	82.10%

Vehicle Type	Ignoring Unknowns	Assuming Unknowns as not belted
Cars	92.00%	91.30%
Pickups	78.80%	76.70%
All Pass.	89.90%	88.80%

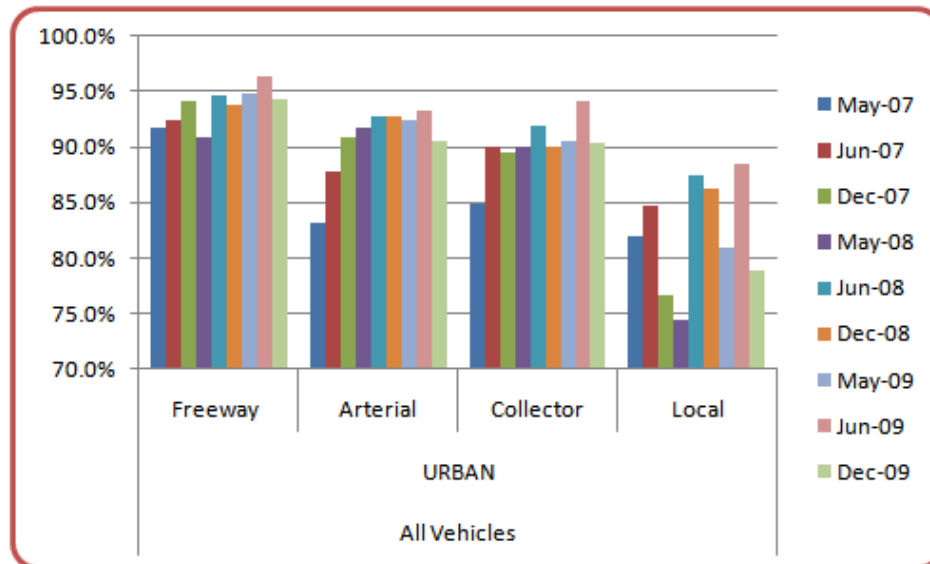
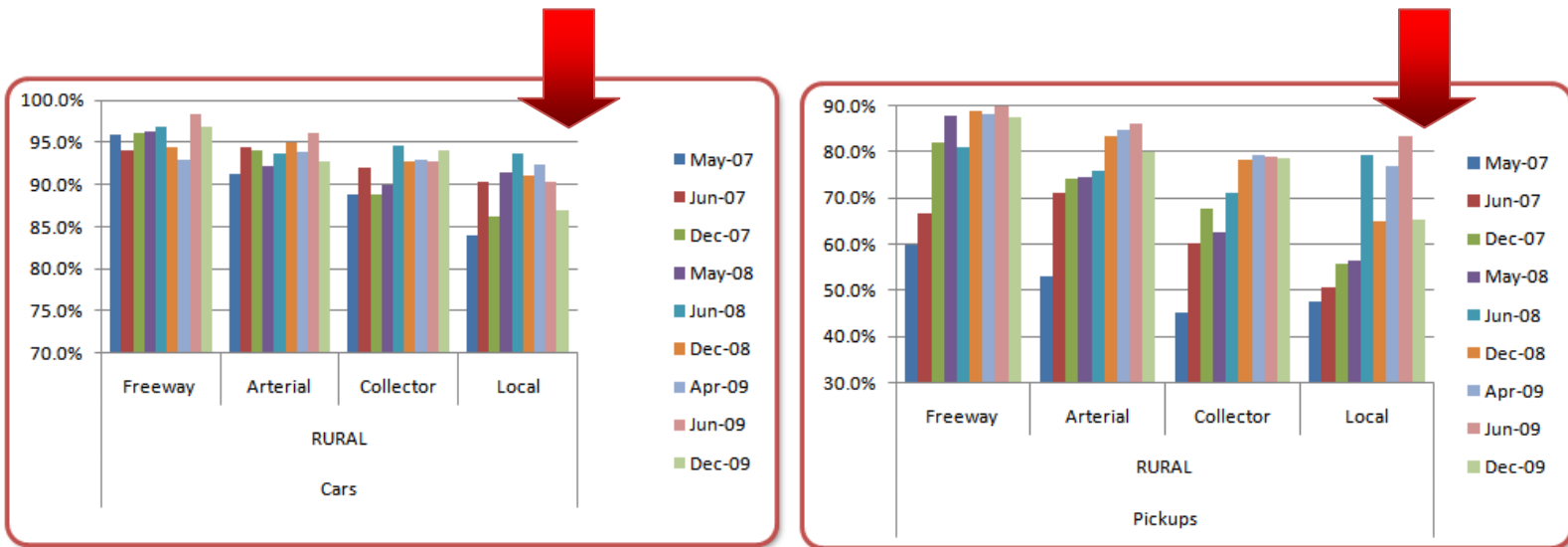
### Usage by Vehicle Type and Road Classes

	Cars				Pickups				All Vehicles			
	RURAL				RURAL				RURAL			
	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local
May-07	96.0%	91.2%	88.9%	83.9%	60.0%	52.9%	45.0%	47.4%	88.2%	83.7%	77.2%	78.1%
Jun-07	94.0%	94.5%	92.0%	90.3%	66.5%	71.0%	60.2%	50.6%	88.3%	90.4%	85.0%	81.1%
Dec-07	96.1%	94.1%	88.8%	86.3%	82.1%	74.3%	67.6%	55.8%	92.0%	88.5%	85.7%	77.2%
May-08	96.3%	92.2%	89.9%	91.5%	87.8%	74.4%	62.7%	56.4%	94.5%	88.2%	82.3%	81.0%
Jun-08	96.8%	93.6%	94.7%	93.7%	81.1%	76.0%	71.2%	79.2%	93.7%	89.2%	88.1%	89.5%
Dec-08	94.5%	95.0%	92.7%	91.1%	89.0%	83.4%	78.1%	64.8%	94.0%	92.8%	89.1%	82.4%
Apr-09	93.0%	93.9%	93.0%	92.4%	88.3%	84.7%	79.2%	76.9%	93.4%	92.5%	90.6%	86.2%
Jun-09	98.4%	96.2%	92.7%	90.4%	90.0%	86.0%	78.9%	83.3%	96.4%	93.5%	89.0%	88.9%
Dec-09	96.9%	92.7%	94.1%	86.9%	87.3%	79.9%	78.7%	65.3%	94.5%	89.8%	89.8%	83.7%

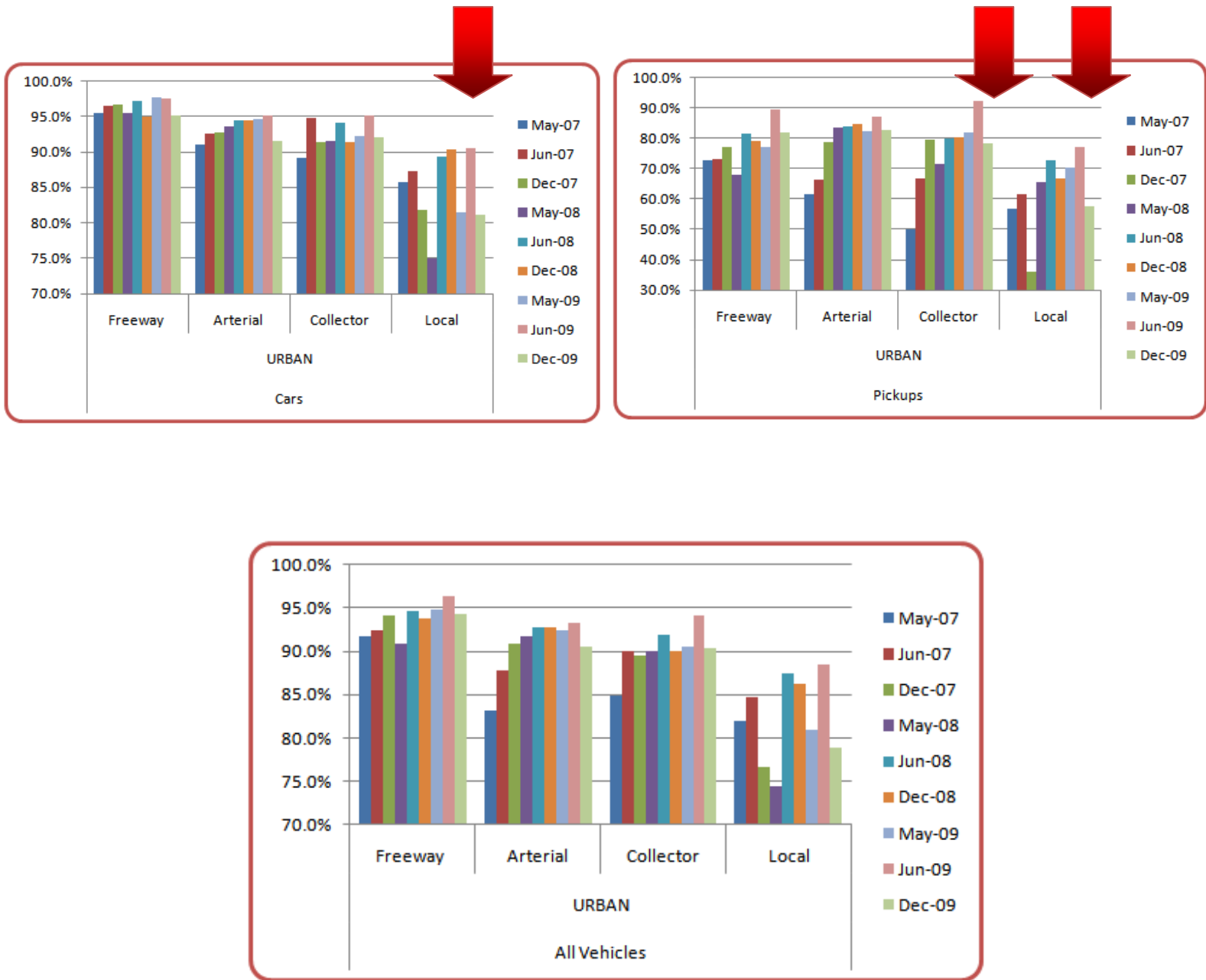
	Cars				Pickups				All Vehicles			
	URBAN				URBAN				URBAN			
	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local
May-07	95.4%	91.0%	89.1%	85.7%	72.8%	61.7%	50.0%	56.6%	91.8%	83.1%	84.8%	81.9%
Jun-07	96.5%	92.6%	94.8%	87.2%	73.0%	66.3%	66.7%	61.4%	92.5%	87.8%	90.1%	84.7%
Dec-07	96.6%	92.8%	91.3%	81.8%	77.0%	78.7%	79.3%	36.0%	94.2%	90.8%	89.5%	76.6%
May-08	95.4%	93.6%	91.6%	75.0%	68.0%	83.4%	71.5%	65.4%	90.8%	91.8%	90.1%	74.5%
Jun-08	97.1%	94.5%	94.1%	89.4%	81.4%	83.9%	79.9%	72.5%	94.7%	92.7%	91.9%	87.4%
Dec-08	94.9%	94.5%	91.4%	90.3%	79.2%	84.6%	80.4%	66.9%	93.8%	92.8%	90.0%	86.3%
May-09	97.7%	94.6%	92.2%	81.5%	76.9%	82.3%	81.7%	70.3%	94.8%	92.4%	90.5%	81.0%
Jun-09	97.5%	95.1%	95.1%	90.5%	89.5%	87.0%	92.1%	77.1%	96.4%	93.2%	94.1%	88.5%
Dec-09	95.1%	91.6%	92.1%	81.2%	81.9%	82.5%	78.2%	57.4%	94.2%	90.6%	90.3%	78.9%

- Pickup truck safety belt usage experienced a substantial decrease on rural and urban local roads, as well as urban collectors.

### Usage by Rural Road Classes



### Usage by Urban Road Classes



## Basic cell phone usage patterns observed

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
Not restrained	768	92.6	61	7.4
Restrained	6460	95.0	342	5.0
Unknown	120	96.8	4	3.2

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
Car	3179	95.1	164	4.9
Motorcycle	10	100.0	0	0.0
Comercial	574	96.8	19	3.2
Pickups	1300	95.1	67	4.9
Vans	734	94.0	47	6.0
Large Vans	115	95.0	6	5.0
SUV	1436	93.3	104	6.8

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
Adult	7083	94.9	380	5.1
Young	254	90.4	27	9.6
Unknown	12	100.0		0.0

•7.4% of unrestrained drivers were using cell phones vs. only 5% of restrained drivers.

•SUV drivers were the groups with the highest usage of cell phones, at around 6%. Cars and pickups tied at 4.9%.

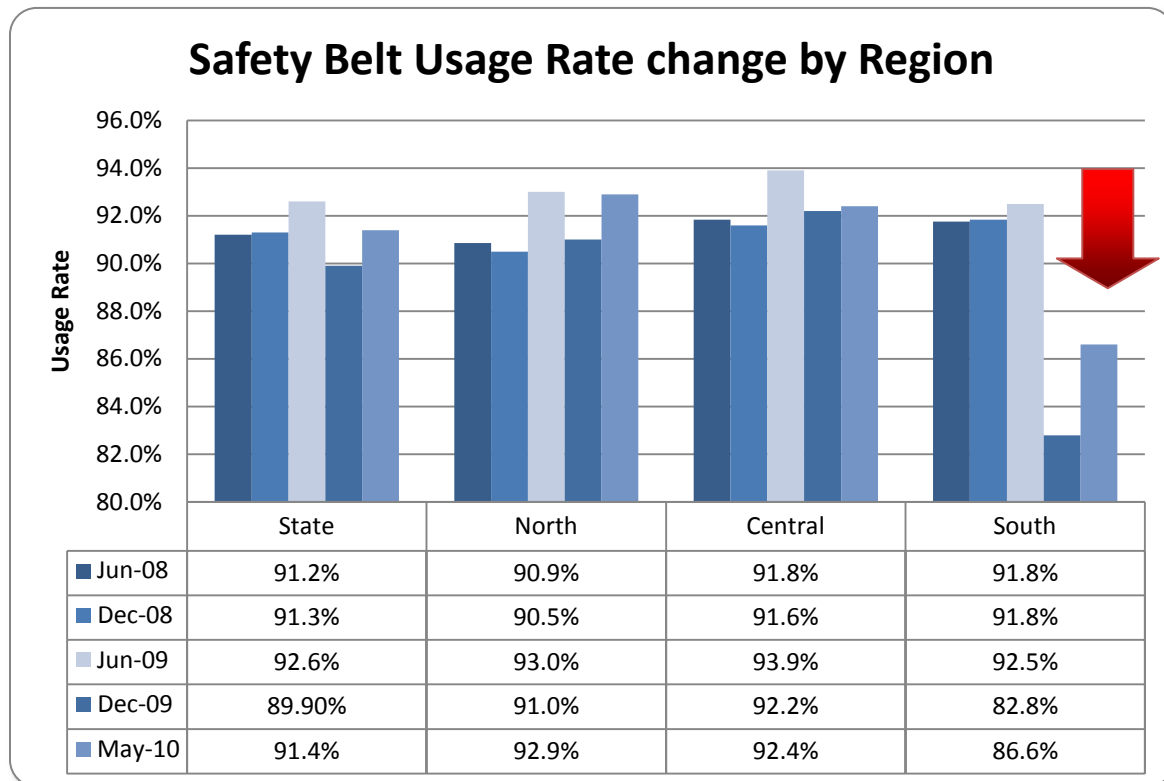
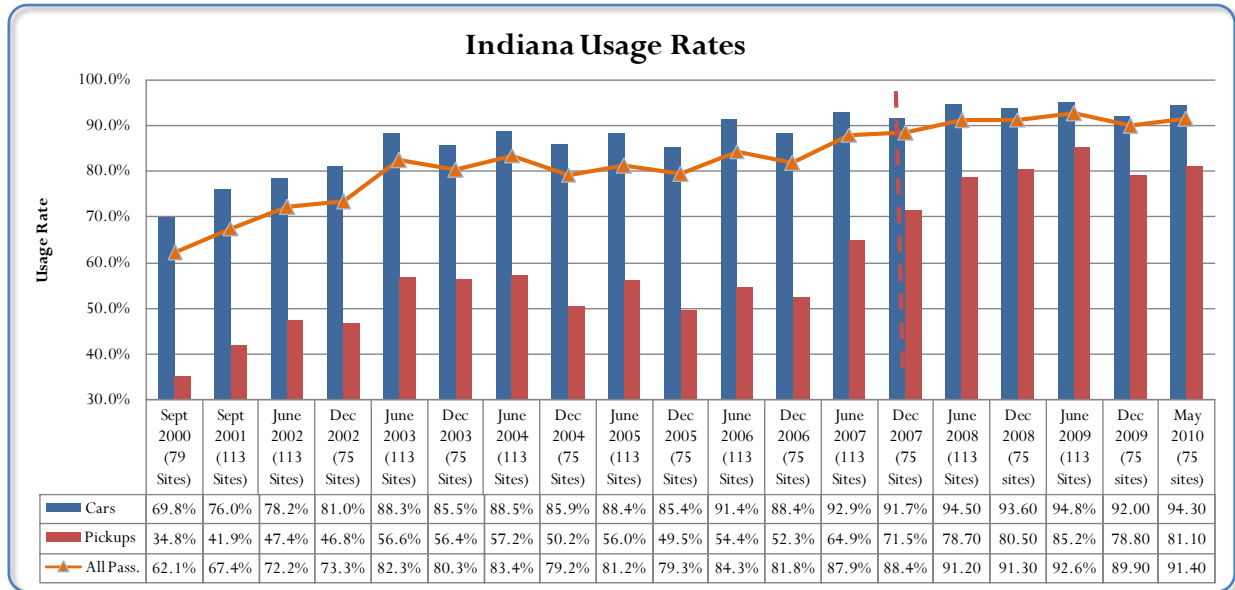
•Young drivers usage of cells were almost twice that of adult drivers.

•Female drivers used cell phones almost 60% more than male drivers (6.8% vs. 4.3%).

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
F	2843	93.2	206	6.8
M	4490	95.7	201	4.3
U	16	100.0	0	0.0



## **Appendix C – Tables and Figures from the Indiana May 2010 Mini Survey**



### Effect of Unknowns on Usage Rate

These two tables are intended to illustrate the effect of ignoring the unknowns when calculating the usage rate. “Unknown” should only be marked when, after significant effort, the observer cannot see a safety belt but is not completely sure the belt was not being used. Research has shown that in a large number of these cases, the occupant is indeed unbelted. The numbers presented assume that all unknowns were not belted and thus represent the lower bound for the usage rates.

Region	Ignoring Unknowns	Assuming Unknowns as not belted
State	91.4%	90.7%
North	92.9%	90.6%
Central	92.4%	92.3%
South	86.6%	85.0%

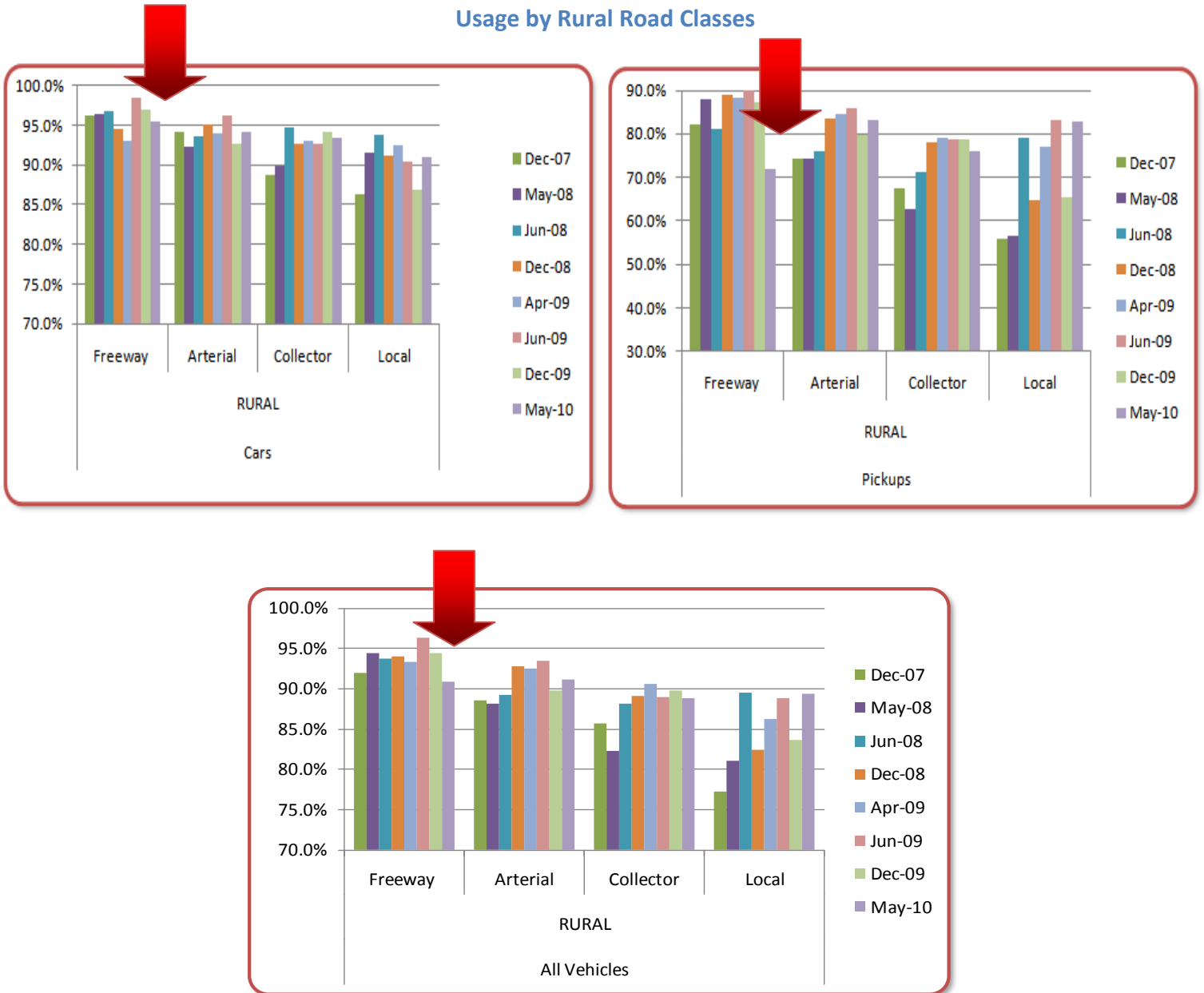
Vehicle Type	Ignoring Unknowns	Assuming Unknowns as not belted
Cars	94.3%	93.7%
Pickups	81.1%	80.0%
All Pass.	91.4%	90.7%

### Usage by Vehicle Type and Road Classes

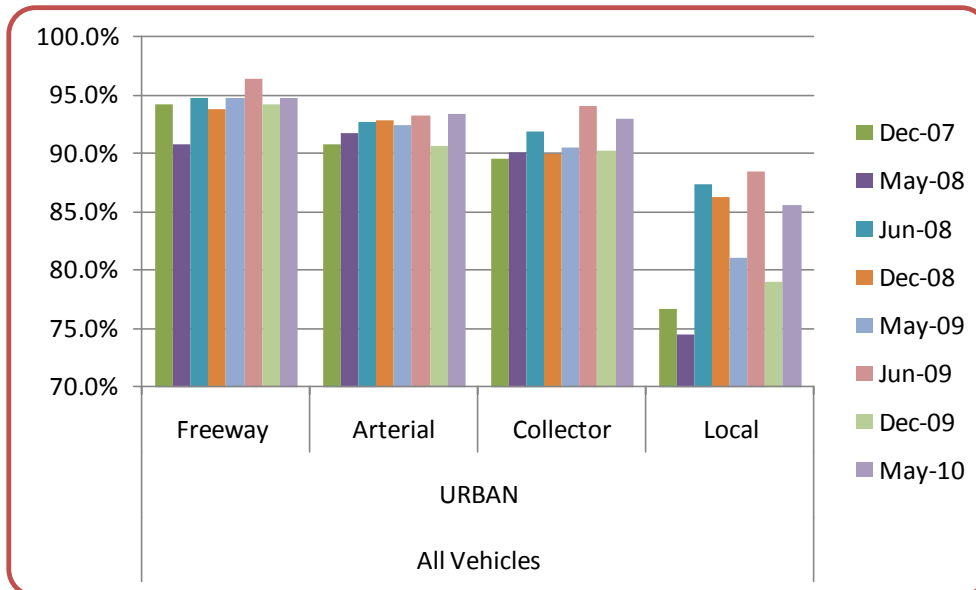
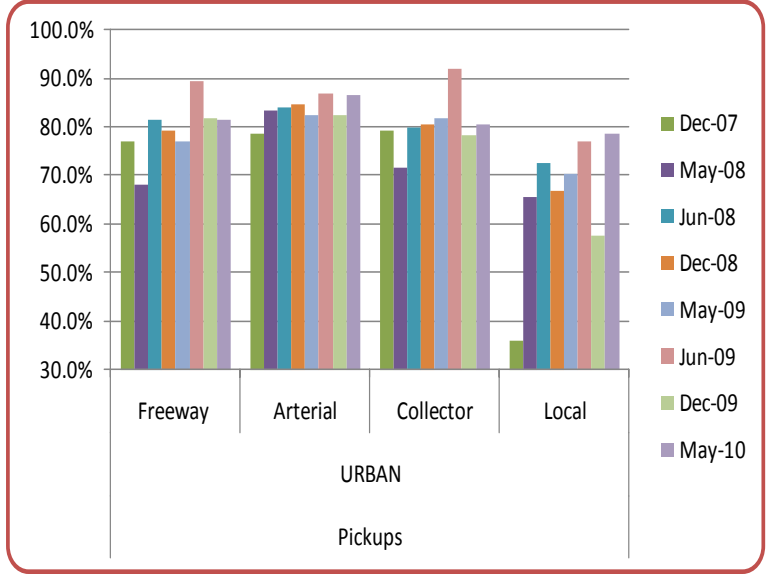
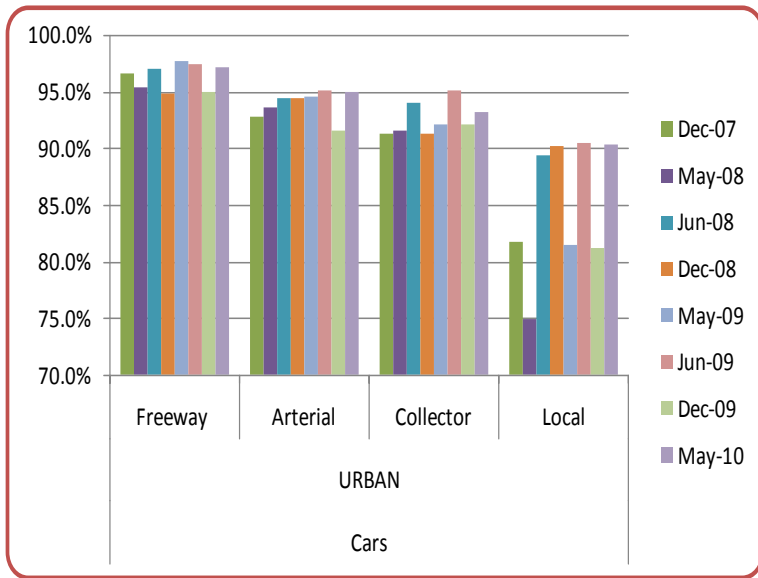
	Cars				Pickups				All Vehicles			
	RURAL				RURAL				RURAL			
	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local
Dec-07	96.1%	94.1%	88.8%	86.3%	82.1%	74.3%	67.6%	55.8%	92.0%	88.5%	85.7%	77.2%
May-08	96.3%	92.2%	89.9%	91.5%	87.8%	74.4%	62.7%	56.4%	94.5%	88.2%	82.3%	81.0%
Jun-08	96.8%	93.6%	94.7%	93.7%	81.1%	76.0%	71.2%	79.2%	93.7%	89.2%	88.1%	89.5%
Dec-08	94.5%	95.0%	92.7%	91.1%	89.0%	83.4%	78.1%	64.8%	94.0%	92.8%	89.1%	82.4%
Apr-09	93.0%	93.9%	93.0%	92.4%	88.3%	84.7%	79.2%	76.9%	93.4%	92.5%	90.6%	86.2%
Jun-09	98.4%	96.2%	92.7%	90.4%	90.0%	86.0%	78.9%	83.3%	96.4%	93.5%	89.0%	88.9%
Dec-09	96.9%	92.7%	94.1%	86.9%	87.3%	79.9%	78.7%	65.3%	94.5%	89.8%	89.8%	83.7%
May-10	95.5%	94.0%	93.4%	91.0%	72.0%	83.2%	75.9%	82.8%	90.9%	91.2%	88.9%	89.4%
	Cars				Pickups				All Vehicles			
	URBAN				URBAN				URBAN			
	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local	Freeway	Arterial	Collector	Local
Dec-07	96.6%	92.8%	91.3%	81.8%	77.0%	78.7%	79.3%	36.0%	94.2%	90.8%	89.5%	76.6%
May-08	95.4%	93.6%	91.6%	75.0%	68.0%	83.4%	71.5%	65.4%	90.8%	91.8%	90.1%	74.5%
Jun-08	97.1%	94.5%	94.1%	89.4%	81.4%	83.9%	79.9%	72.5%	94.7%	92.7%	91.9%	87.4%
Dec-08	94.9%	94.5%	91.4%	90.3%	79.2%	84.6%	80.4%	66.9%	93.8%	92.8%	90.0%	86.3%
May-09	97.7%	94.6%	92.2%	81.5%	76.9%	82.3%	81.7%	70.3%	94.8%	92.4%	90.5%	81.0%
Jun-09	97.5%	95.1%	95.1%	90.5%	89.5%	87.0%	92.1%	77.1%	96.4%	93.2%	94.1%	88.5%
Dec-09	95.1%	91.6%	92.1%	81.2%	81.9%	82.5%	78.2%	57.4%	94.2%	90.6%	90.3%	78.9%
May-10	97.2%	95.0%	93.3%	90.3%	81.4%	86.4%	80.4%	78.7%	94.8%	93.4%	93.0%	85.5%

Seat belt usage in pickup trucks and cars has exhibited a decreasing trend on rural freeways since June 2009. Similar losses were also seen in pickup truck usage on urban freeways and collectors. The other classes have recovered from their previous losses and are now at their previous record levels.

### Usage by Rural Road Classes



### Usage by Urban Road Classes



## Basic cell phone usage patterns observed

Driver Usage	No cell		Cell	
	Counts	%	Counts	%
Not restrained	1060	95.3	52	4.7
Restrained	8682	94.7	488	5.3
Unknown	111	86.1	18	14.0

Vehicle	No cell		Cell	
	Counts	%	Counts	%
Car	4112	94.8	227	5.2
Motorcycle	167	99.4	1	0.6
Comercial	725	95.1	37	4.9
Pickups	1839	95.3	91	4.7
Vans	927	94.2	57	5.8
Large Vans	141	94.6	8	5.4
SUV	1942	93.4	137	6.6

Driver Age	No cell		Cell	
	Counts	%	Counts	%
Adult	9481	94.8	522	5.2
Young	368	91.1	36	8.9
Unknown	4	100.0	0	0.0

•5.3% of restrained drivers were using cell phones vs. only 4.7% of un restrained drivers.

•SUV drivers were the groups with the highest usage of cell phones, at around 6.6%. Cars and pickups were close at 5.2% and 4.7% respectively.

•Young drivers usage of cells were 70% higher than that of adult drivers.

•Female drivers used cell phones almost 70% more than male drivers (7.1% vs. 4.2%).

Driver gender	No cell		Cell	
	Counts	%	Counts	%
F	3828	92.9	293	7.1
M	6016	95.8	265	4.2
U	8	100.0	0	0.0